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July 1984
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Microkids™

THE MAGAZINE FOR KIDS WHO LOVE COMPUTERS

WPS 36633

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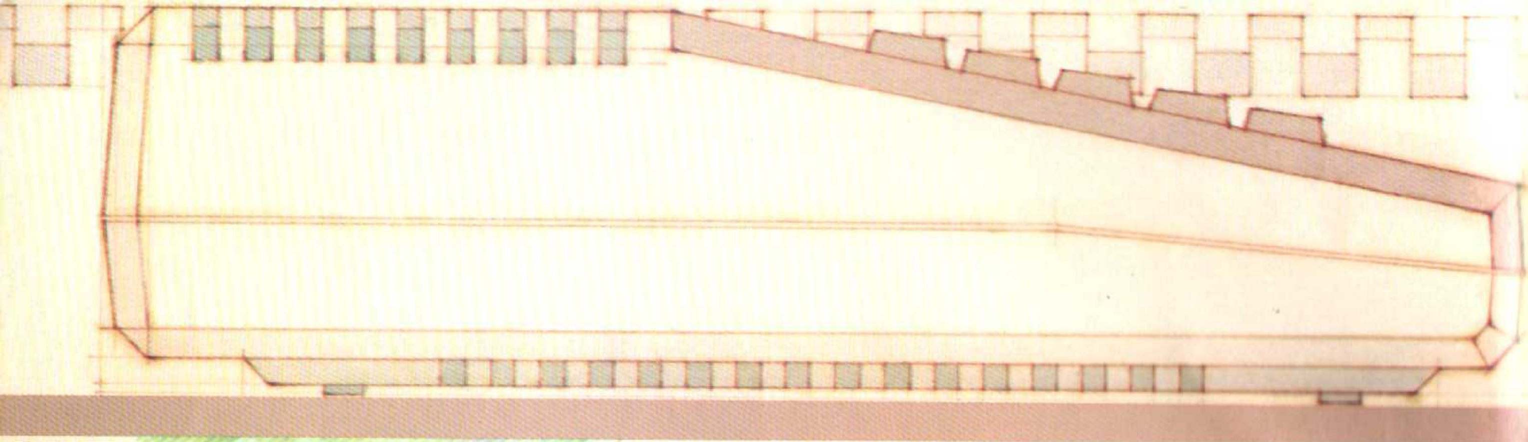

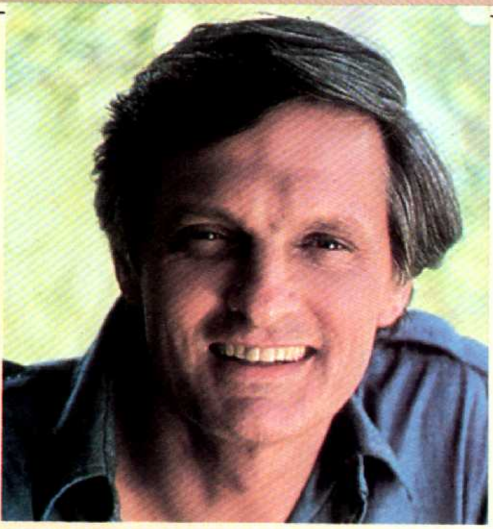

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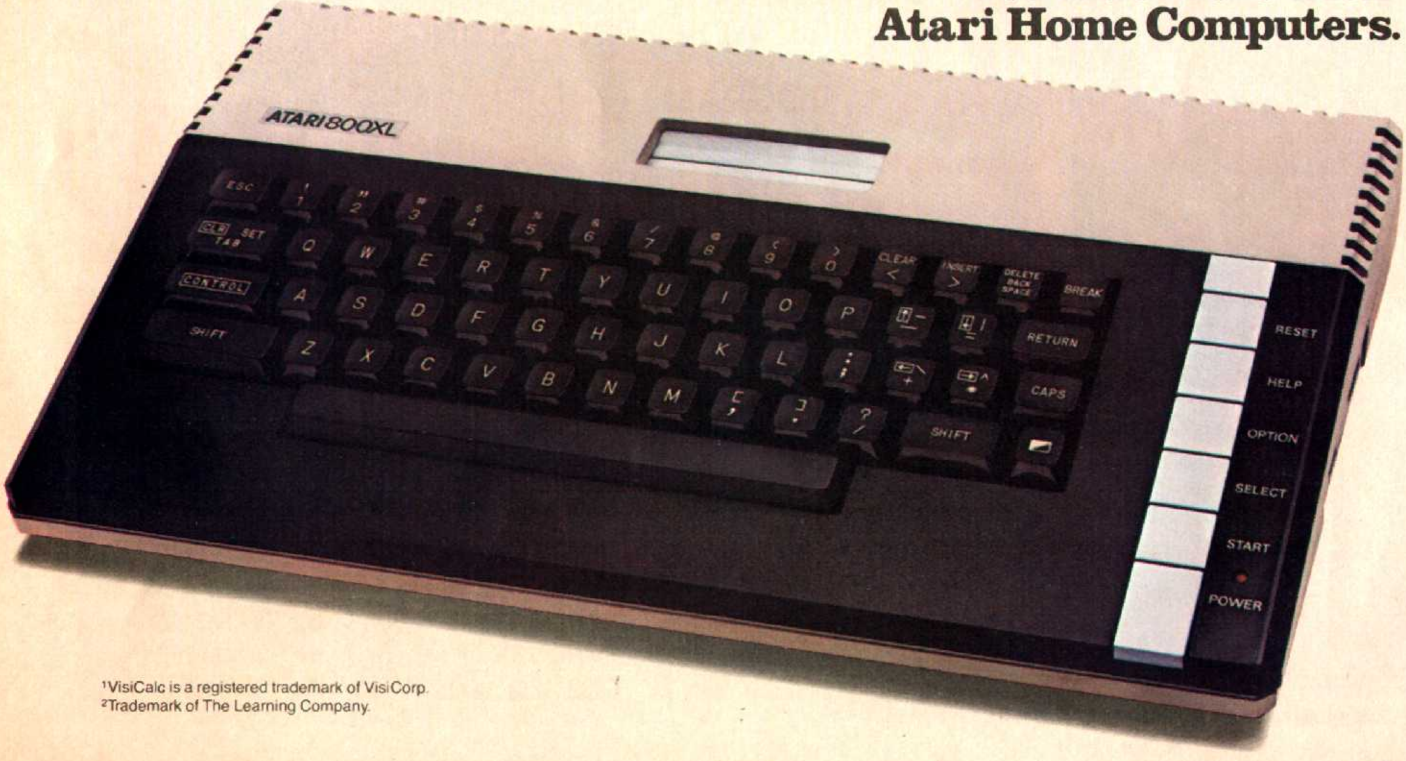

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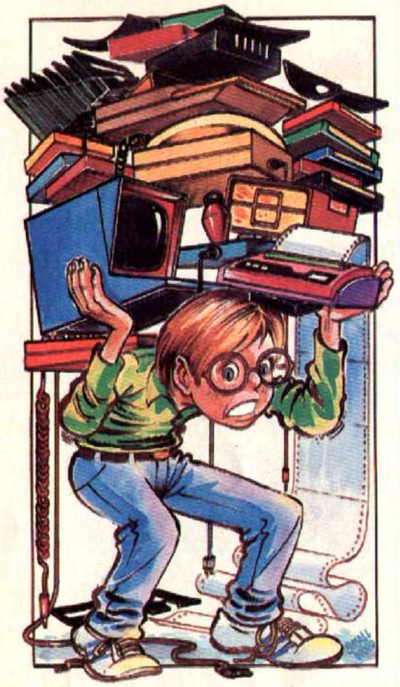
JUNE/JULY 1984
VOLUME 1, NUMBER 4

Microkids™

THE MAGAZINE FOR KIDS WHO LOVE COMPUTERS



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–Rex Weed

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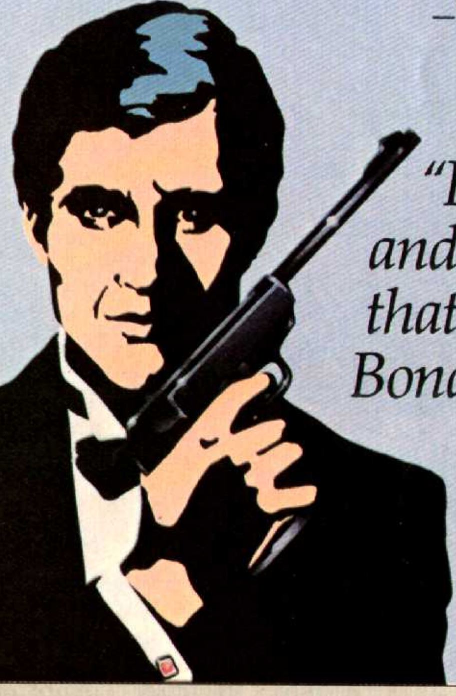

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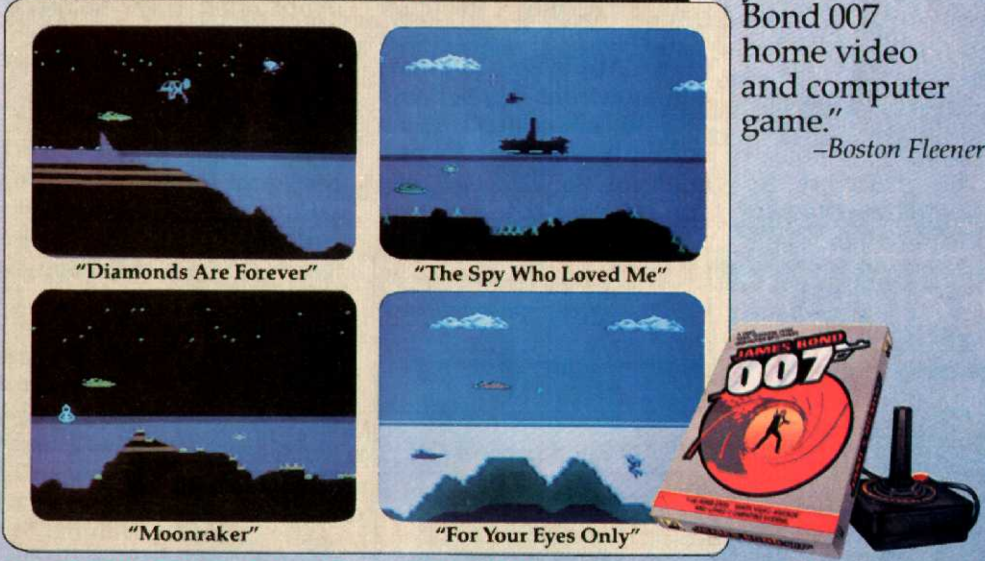

"Diamonds Are Forever"

"The Spy Who Loved Me"

"Moonraker"

"For Your Eyes Only"

Now available for Atari 2600™, 5200™, ColecoVision™, Atari® Home Computers and Commodore 64™.

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LETTERS TO THE EDITOR

A New Fan. I have just finished reading your premiere Nov./Dec. issue. I must congratulate you on a job well done. The magazine is fabulous! There aren't any words that are good enough to describe it. I have just subscribed—I know I won't regret it. Keep up the great work.

Gregg Proieth
Bedford Hills, NY

No Sooner Asked. The laser disk video game Dragon's Lair is the best game ever released. Who would ever think he could play a video game with graphics like a cartoon? Will there be a home game system using laser disks, or hasn't it been thought of yet?

Tommy Garland
Tinton Falls, NJ

Than Answered. *Coleco will release Dragon's Lair for the Adam system.*

Micromom. Your premiere issue is great, and I am looking forward to more. I bought **Microkids** when I was shopping for software for my stepson's birthday. I bought the magazine for him, but I ended up reading it first. Please begin a subscription for him immediately.

Margaret Peterson
Houston, TX

Inspired Reader. I bought your premiere issue recently in my pharmacy, and all I can think of is, WOW! The articles, especially the one about Tim Knight, inspired me to do work on my Apple. Already I've made $60 writing a program for my dad. It's for his files on his computer. I know Applesoft BASIC through and through.

Matt Millheiser
Miami, FL

Share and Share Alike. I would like to have people write to me so I can send them some of my programs for the TRS-80 Micro Color Computer, MC-10. Since you don't print that much about the MC-10, I would like other MC-10ers to share my programs. Your magazine is No. 1.

Chris Price
2204 Latham St.
Bakersfield, CA 93306

All Fired Up. I didn't realize the money-making possibilities computers brought to kids my age until I read your magazine. I am 15 and enjoy working with computers and writing programs. I have a TI 99/4A with cassette recorder adapter. I also have access to two Apple IIe computers and numerous Apple II and TRS-80 computers. I am currently working on a program for the TI 99/4A and am adapting it to work on the Apple IIe. I am writing to see if you could tell me who to write to find out how to sell the programs I have created.

Rob Sherwood
Oskaloosa, IA

Microkids On-Line

Microkids is a member of The Source

Send your comments, programs or puzzles to us at our bulletin board address

Account Number BBK 483

I need to know how to sell my program. I don't want to have a company look through it and tell me that no one wants it. I saw your article in the December issue of **Microkids**. Tim Knight advertised his program in a magazine and got a great response. Do you know where I could advertise my program? I was also wondering if it would be possible to get in touch with Tim Knight. He sounds like a neat guy!

Clint McClennan
Ketchikan, AL

Microkids *will have a story soon about selling your programs. Watch for it in an upcoming issue! And don't miss our story in this issue about other ways to make money with your computer. We've forwarded your letter to Tim Knight.*

Seek and Join Mission. I'm a Commodore VIC-20 user and proud of it. The problem is, there aren't enough user groups in my area. If you have received requests similar to my own, please refer me to them or them to me. I am interested mostly in kids age 10 to 16. Thank you for your help!

Colin Johnston
1503A Dolores St.
San Francisco, CA 94110

More letters on page 6

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Crayola

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You're going to need all your cunning and intelligence to stop the FuzzBomb from turning the U.S.A. into a nation of fuzzbodies.

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LETTERS TO THE EDITOR

Apple Conversion. As I was reading your magazine (March 1984 issue), the program "Bertha Day," written by David Lewis, fascinated me. I wanted to use this program on an Apple IIe. After a few days of experimenting, I have adapted this program to Applesoft BASIC by changing these lines:

```
5 HOME: PRINT "Hi there! My
  name is Bertha Day, and I'm a
  Birthday Teller from Texas."
30 HOME: INPUT "First, I need to
   know your name. What is it?";
   N$
40 PRINT: INPUT "And what year
   were you born in?";
   Y$:Y=VAL(Y$)
45 IF Y<1900 or Y>1999 THEN
   PRINT "Wow! I can't do that!":
   GOTO 40
47 VAR=5/4*VAL(RIGHT$(Y$,2))
60 PRINT:INPUT "What is the
   number of the month you
   were born in? Count them so
   that January is 1, February is
   2, March is 3, and so
   on";M$:M=VAL(M$)
65 IF M<1 OR M>12 THEN PRINT
   "I've never heard of that
   month.":GOTO 60
110 PRINT:INPUT "Press return to
    put me into a short
    trance";X$
170 RESTORE:FOR G=1 TO M:READ
    W:NEXT
220 HOME:PRINT 320,N$;" , you
    were born on a"D$"!"
```

I hope that fellow readers with Apple IIe have as much fun with it as I did.

Dawn-Marie Davide
Mystic Islands, NJ

Strung Out. On page 20 of your December issue, under "Tips for TRS-80s" (Hands On), line 30 is incorrect as listed. The word "STRINGS$" should be "STRING$"—the "S" should not be there. Your magazine is very good and I enjoyed reading it.

Chris Oltmer
Ringwood, NJ

Rubbing the Wrong Way. I hope you will welcome a letter from someone who is not a kid. First, let me congratulate you on an excellent first issue.

In "Input/Output," Michael Hyman answered a question about characters that appear randomly across the screen in the middle of a program. He suggests rubbing the circuits with a clean eraser. This can cause disastrous results—voiding your warranty or causing metal mismatch (which will require you to replace the board).

I would recommend that readers follow the last part of his answer: "See your dealer. . . . that's probably the first thing you ought to do and forget all the rest."

Priscilla K. Hoyt
Senior Programmer Analyst
Data Processing Dept.
Long-Bell Cabinets, Inc.
Longview, WA

Question One. I have a question for you. How do you get your parents to buy a computer? I've told them how we could use one, but they always answer, "They're too expensive."

Annette DeJesus
Richmond Hill, NY

Question, Too. In your premiere issue there was a program for TRS-80 computers—"Think Snow," p. 51. I tried it on my computer, a TI 99/4A, and it worked until it got to line 240. Can you help me make it work for my computer?

Annette DeJesus

Congratulations! It looks as though you were able to convince your parents after all! Line 240 is a random statement—TI 99/4A writes its random statements like this:

```
240 LET B=INT(RND*48)-1
250 LET T=INT(RND*128)-1
```

Delete line 260. Because a TI is very different from a TRS-80, your program won't look as it should, but you will get a graphics display. Programs with these commands—CHR$, PEEK, POKE, CALL—can't be used on different computers very easily.

Wrong Apple. I really enjoy your magazine **Microkids**, especially the programs you run. In your premiere issue, picture No. 10 in the article "How to Grow an Apple. . ." says: "and here it is fully assembled—a brand, spanking new Apple IIe. Tada!" But the picture shows an Apple II+; I can tell by the nameplate and the keys. Keep the magazines coming. I can't wait to see the next issue.

Douglas DiCarlo
Grafton, VA

. . . The picture shows an Apple II+ and the caption says it's an Apple IIe. I just wanted to let you know I found the error. I like your magazine a lot.

David Hirsch
Seminole, FL

Short of Data. In the March 1984 edition, on p. 60, you list a program called "Space Sprites" for the Commodore 64. I typed the program into our computer, but every time I run it, I get an Out of Data Error in line 1090. We have tried to fix the line but still get an error. Could you help us?

Joshua Levine
Charlotte, NC

There's no error in line 1090—you've made an error in the data—line 10000 to line 10810. If you left out a comma, or a number, the computer will run out of data before it's through reading. Double-check your data lines.

Corrections. "Bertha Day," March 1984, p. 30:

```
60 PRINT:INPUT "What is the
   number of the month you
   were born in? Count them so
   January is 1, February is 2,
   March is 3, and so
   on";MO=VAL(MO$)
220 CLS:PRINT @ 320, N$,".you
    were born on a ";D$"!"
```

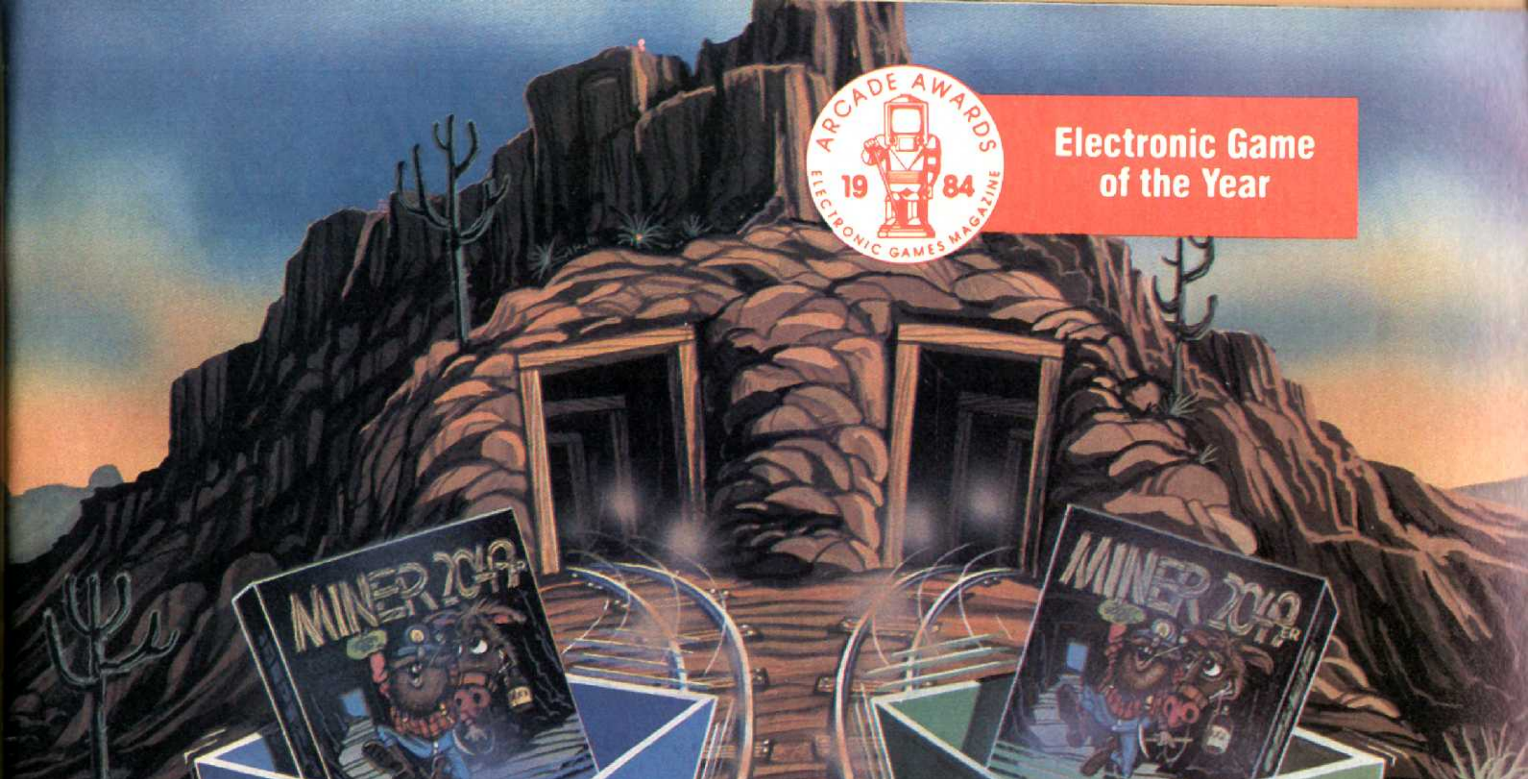
"The Sound & The Fury," March 1984, p. 79, middle program:

```
20 INPUT "TYPE A FREQ AND A
   DURA"; F,D:IF F<0 or D<0 OR
   F>255 OR D>127 THEN 20
```

"How To Make Your Own Secret Codes," March 1984, p. 62. Message at end of story—line 2 should be:

126 13 93 24 ■

Tell us what you think! Send your letters to: ***Microkids****, 133 Fifth Ave., New York, NY 10003. Or to The Source, Acct. No. BBK483.*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Mind Benders

THE GREY FOG, PART I

BY CAPTAIN CRYPTO

The first stanza of my cronicle about my archenemy, The Grey Fog, is recorded below. If it does not seem clear to you, it is because he has clouded your mind as he does mine.

AY / ED / GIDRRO / SIIPTCETH
EEHLESNE / / SPSC / BUAIWMJA
CA / RKYZX / EDKASE / DN / CY
TBLOHE / SA / UWYAEM / SAB
NYBTEN / NUCDR / S / AMBM
NEER
NPRDOLWUEO / FNXBP VT /
LTOAE / WWVN /TDI / HE

Enter one line at a time into the following program. Of course, as a safety precaution, the unfogged text appears on the answer page.

```
100 REM CAPTAIN CRYPTO
110 REM THE GREY FOG,
    CIPHER #3
120 M=6
130 D=M*M
140 DIM S(D),U(D)
150 REM SET UP SCRAMBLERS
160 FOR I=1 TO D
170 READ S(I)
180 NEXT I
190 FOR I=1 TO D
200 U(S(I))=I
210 NEXT I
220 REM GET MESSAGE
230 PRINT "ENTER TEXT: ";
240 INPUT T$
250 IF LEN(T$)<>INT(LEN(T$)/
    36)*36 THEN T$=T$+" "
260 PRINT "ENTER S TO
    SCRAMBLE OR U TO
    UNSCRAMBLE: ";
270 INPUT M$
280 IF M$<>"S" AND
    M$<>"U" THEN 260
290 REM ELIMINATE SPACES
300 C$=""
310 FOR I=1 TO LEN(T$)
320 IF MID$(T$,I,1)=" " THEN
    C$=C$+"/"
330 IF MID$(T$,I,1)<>" " THEN
    C$=C$+MID$(T$,I,1)
340 NEXT I
350 IF LEN(C$)>=D THEN
    T$=LEFT$(C$,D)
360 IF LEN(C$)<D THEN T$=C$
370 REM PAD MESSAGE
375 IF LEN(T$)>=36 THEN 420
380 FOR I=LEN(T$)+1 TO D
390 R=INT(25*RND(1))+65
400 T$=T$+CHR$(R)
410 NEXT I
420 REM PROCESS MESSAGE
430 X=LEN(T$)
440 S$=""
450 IF M$="U" THEN 510
460 REM SCRAMBLE MESSAGE
470 FOR I=1 TO X
480 S$=S$+MID$(T$,S(I),1)
490 NEXT I
500 GOTO 550
510 REM UNSCRAMBLE
    MESSAGE
520 FOR I=1 TO X
530 S$=S$+MID$(T$,U(I),1)
540 NEXT I
550 REM PRINT
560 PRINT T$
570 PRINT "PROCESSED
    MESSAGE:"
580 PRINT S$
590 IF LEN(C$)>D THEN 610
600 GOTO 230
610 C$=RIGHT$(C$,LEN(C$)-D)
620 GOTO 350
630 REM DATA
640 DATA 32, 31, 25, 19, 26, 33,
    34, 27, 20, 13, 7
650 DATA 14, 21, 28, 35, 36, 29,
    22, 15, 8, 1, 2, 9, 16
660 DATA 23, 30, 24, 17, 10, 3,
    4, 11, 18, 12, 5, 6
```

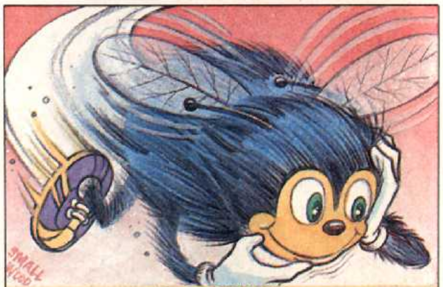
Do you know a puzzle, riddle or word game for this page? Send it to: Mind-Benders, ***Microkids,*** *133 Fifth Ave., New York, NY 10003. Or send it to us at The Source, Acct. No. BBK483. If we publish it we will pay you $25.*

THIS DAY AND AGE

BY DAVID LEWIS

Age problems tend to be hard problems, and a lot of people would like to lay their hands on their inventors. But try laying your hands on this one:

"The day before yesterday I was 13, but next year I'll be 16." On what day was this statement made?



A FLY'S FLEETING FLIGHT

BY DAVID LEWIS

Abby Normal and Liz Ard are exactly one-fourth of a mile apart and bicycling toward each other, Abby at 12 m.p.h. and Liz at 8 m.p.h.

A tireless fly with a thirst for adventure begins flying back and forth between the two at a constant speed of 30 m.p.h., turning as soon as it reaches the oncoming bicycle (it started on Liz's bike, by the way).

The fly continues this flight between the two, making shorter and shorter trips each time, until it meets a horrible death as the two cyclists bump front wheels.

How far did the fly travel before the crash?

ANSWERS ON PAGE 64

Chalk Board™ wants your opinion.

Chalk Board wants you to help direct the company's future. We are beginning a new user input program. If you would like to become part of this innovative new concept, start by filling out the questionaire below.

1. **Are you aware of and familiar with the new peripheral, the Chalk Board PowerPad™ touch-tablet?**

   Yes ☐ No ☐ (You can find out more at your local computer store)

2. **There are many unique features that are offered only on the Chalk Board PowerPad. We would like to know which is the most important to you. (Please rank 1-5)**

   ☐ Multi-point contact capability
   ☐ Large active work surface 12″ x 12″
   ☐ Allows functions that cannot be performed with a keyboard.
   ☐ Programmable surface
   ☐ Graphics/Music/Game Design/Versatility

3. **Which of the following uses of the Chalk Board PowerPad that have already been discovered do you think are most important? (Please rank 1-6)**

   ☐ Graphics
   ☐ Music composition
   ☐ Game design
   ☐ Special effects
   ☐ Programming
   ☐ Learning through discovery

4. **Which of the following uses of the Chalk Board PowerPad currently under development do you consider the most important? (Please rank 1-5)**

   ☐ Free-form game play
   ☐ Test preparation (SAT, ACT, etc.)
   ☐ Custom video design
   ☐ Laser disk control
   ☐ Artificial intelligence

5. **What other uses can you imagine for the Chalk Board PowerPad.**

   A. ____________________

   B. ____________________

Here's how to make your opinion worth $50.

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MATCH GAME

BY JESSICA MITCHELL

This puzzle contains 20 keywords used with the Apple and other computers. To make it harder, we won't tell you what those keywords are. Can you find all 20? Remember—they'll be hidden horizontally, vertically and diagonally, and both forward and backward. A list of the keywords is included with the solution.

E	T	X	E	T	N	S	T	R	A	E	I	N	P	D
X	S	E	L	D	X	E	T	F	T	I	S	L	A	I
R	F	L	N	I	N	E	S	U	P	I	D	A	T	A
R	E	T	S	I	R	P	N	R	O	N	A	B	E	I
U	C	U	D	T	D	F	N	I	F	P	S	R	L	O
N	S	X	T	I	N	O	J	L	S	U	O	E	F	S
F	I	O	H	O	M	E	E	D	P	T	B	A	R	D
L	F	A	S	R	U	T	P	R	I	M	T	D	E	C
R	O	S	N	F	E	T	R	E	O	S	T	R	S	I
S	R	I	J	T	N	I	R	P	S	T	E	S	P	N
O	L	T	O	K	R	D	I	L	T	O	S	E	R	T
H	A	U	R	N	P	T	O	O	E	N	D	E	S	O
I	R	E	B	U	T	D	R	T	P	M	W	T	R	S
N	M	L	R	T	A	T	L	L	P	S	A	L	B	I
A	S	X	G	O	T	O	R	I	B	A	T	L	S	A

ANSWERS ON PAGE 64

WORD TEST

BY LOUIS SABIN

1	2	3	4	■	5	6	7	■	8	9	10	11
12				■	13			■	14			
15			■	16			■	■	17			
18			19			■	20	21			■	■
■	■	■	22			■	23				24	25
26	27	28		■	■	29			■	30		
31			■	32	33				■	34		
35			■	36			■	■	37			
38			39			■	40	41		■	■	■
■	■	42				■	43			44	45	46
47	48			■	■	49			■	50		
51				■	52			■	53			
54				■	55			■	56			

ACROSS

1 Processor's symbol: Abbr.
5 Geologist's time period
8 Sermon's last word
12 Breakpoint ---- (closed loop)
13 Horizontal line of symbols
14 Oceanic flow
15 Sick
16 Power-driven accounting apparatus: Abbr.
17 ---- check (way to check transmission by returning info)
18 Inside or outside facilities
20 "---- Wars"
22 Top-notch processor
23 ------ access (communication with a facility via info link)
26 Kind of pirate
29 Symbol that means *disregard*
30 Flop; worthless item
31 ---, amas, amat
32 Screen's double image
34 --- Wan Kenobi, of 20 Across
35 Integrated memory circuit
36 Point a light pen
37 Printer's word meaning *don't change*
38 Processor's "food"
40 Keyboard letter
42 Basic numbers, in France
43 Digital's opposite; form of 28 Down
47 Alpha's follower
49 Soap bubble
50 Basic unit
51 Cake decorator
52 Sleeper's site
53 Food for 28 Down
54 Whig's foe
55 Okay; sure
56 Flower's output

DOWN

1 Integrated circuit
2 Corridor
3 "It's --- - mistake" (2 words)
4 Grid defenseman: Abbr.
5 Wipe away info
6 Permanent info storer, unlike 35 Across
7 Word of disappointment
8 Mr. T's show (with "The")
9 Tiny info-holder
10 Anglo-Saxon letter—th
11 Prefix meaning *modern*
16 And so on: Abbr.
19 Programmer's form of *negative*
20 Senors' wives: Abbr.
21 Boy Scout's house
24 Display ---- (usually a cathode ray type)
25 Change, add to, take away from a tape
26 Mata ---- (WWI spy)
27 "Hardly - --- is now alive": "Paul Revere's Ride" (2 words)
28 Fact processing apparatus
29 Output microfilmer for 28 Down
32 Combinational circuit with a single output channel
33 Snake talk
37 Large body of water
39 ----- operation—monadic operation
40 Units of signalling speed
41 --- around shift—circular shift
44 Enter info
45 With it; in the know
46 Differential ---- (mechanism used for addition or subtraction)
47 Binary digit
48 College course for studying use of money: Abbr.
49 Watch TV
52 "One if -- land. . ."
53 -- nothing operation—no-operation instruction

Earn $25! Have you written a puzzle, riddle or word game for this page? If you'd like to share it, send it to Pencil-Powered, **Microkids,** 133 Fifth Ave., New York, NY 10003. Or send it to us at The Source, Acct. No. BBK483. If we use it, we'll pay you $25!

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ATARI

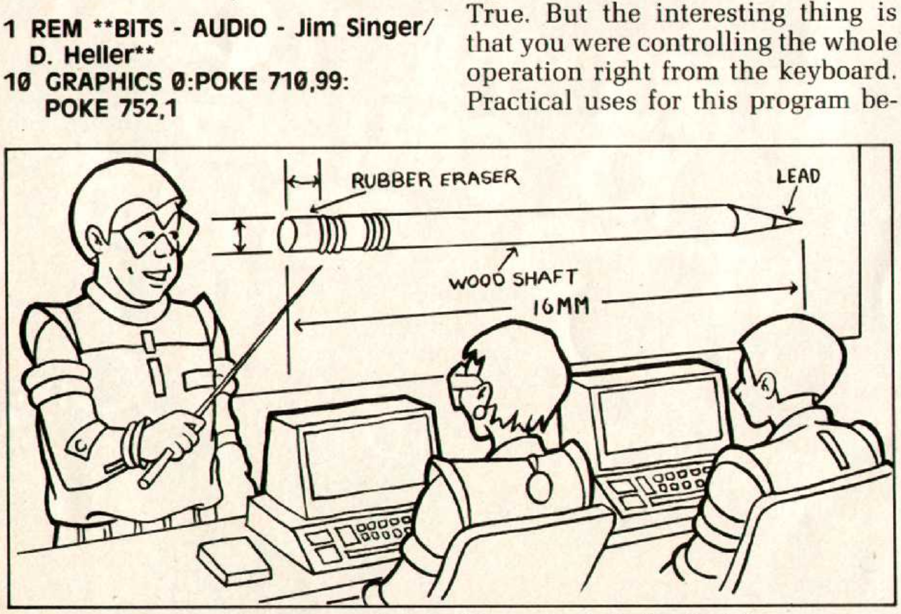
The Atari computer is well known for its stunning graphic capabilities. When playing a popular game, the first thing you notice is the picture on the screen, and somehow the sound is taken for granted. But the Atari is no slouch in the audio department, and three separate sound generators create the often eerie emanations from your TV's speaker.

Most interesting, however, is the fact that the computer itself does not have to create its own sounds. The following program called "Audio" allows you to play any music cassette (like Michael Jackson's "Thriller") on your Atari 410 or 1010 Program Recorder to be heard through your TV's speaker. Two simple pokes are all that's needed. POKE 54018,52 turns the recorder on, and POKE 54018,60 turns it off. (Program reprinted with permission of The Atari Connection, Winter 1984.)

```
1 REM **BITS - AUDIO - Jim Singer/
  D. Heller**
10 GRAPHICS 0:POKE 710,99:
   POKE 752,1
20 POSITION 4,4:PRINT "Press 'O'
   to turn recorder on."
30 POSITION 4,5:PRINT "Press 'S' to
   turn recorder off."
40 IF PEEK (764)=8 THEN POKE
   54018,52:POKE 764,255:POSITION
   16,10:PRINT "ON"
50 IF PEEK (764)=62 THEN POKE
   54018,60:POKE 764,255:POSITION
   16,10:PRINT "OFF"
60 GOTO 40
```

It's that simple. And listening to it is rather interesting, to say the least. First enter and save the program. Then pick out a tape from your music library. Insert the cassette into your recorder and press the play button. Run the program. The computer will tell you to: "Press O to turn the recorder on." Once you do you will hear the music from your TV's speaker. You can turn the recorder off by simply pressing the S key.

At first you may wonder "So what. I can play that same music tape in stereo on my Walkman." True. But the interesting thing is that you were controlling the whole operation right from the keyboard. Practical uses for this program become apparent when you realize that a little "Men At Work" can keep you awake while you're at work. Or that a musical accompaniment to a program might be nice.



"Class, this is an archaic writing and calculating tool."

NEW PRODUCTS

Meanwhile, turning your television screen into an electronic canvas is easy with the help of the new Atari Light Pen. The pen is a hand-held stylus that works in tandem with AtariGraphics, a new software program that allows you to draw images that appear on your TV. Menus can be summoned to the screen with a touch of the pen, giving you various choices of color, hue and intensity, as well as different graphic patterns.

The light pen gives you access to all 128 Atari colors, and hundreds of graphic patterns unique to the new graphics software. Only 16K of memory is needed to run the program, and it will work on any Atari computer.

This new combination of software and hardware will let your creativity flow. You can sketch and erase, with options of using patterned colors, automatic circles and squares, and even mirror images. The entire graphics world can be painted right on the screen and you can use the pen to create new and different types of computer art—as a model for school art and science projects; as a special birthday presentation for a friend or family member, or even as a large memo board in the middle of the living room. Just colorfully spell out on the TV screen that "The A Team" is on at 8pm, and that will be a constant reminder to everyone. Even Mr. T couldn't help but notice.

—Dawn Gordon

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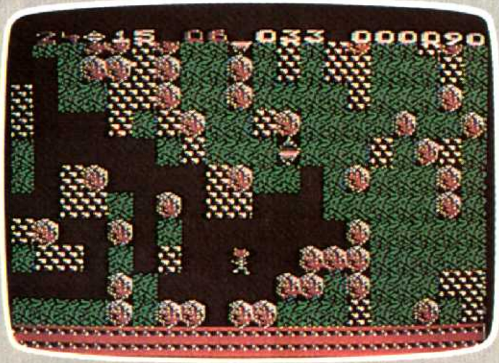
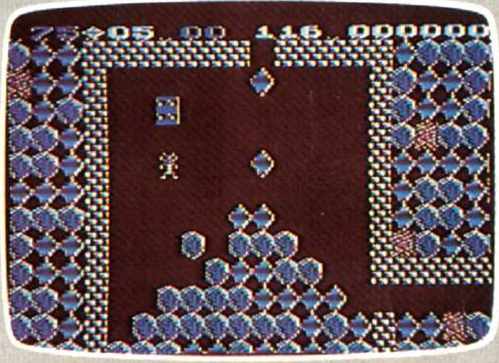


Actual Game Screen Designed by Peter Liepa & Chris Gray



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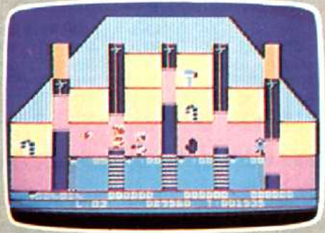

Bristles™
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Fernando Herrera

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PLAYER 1
HIGH SCORE

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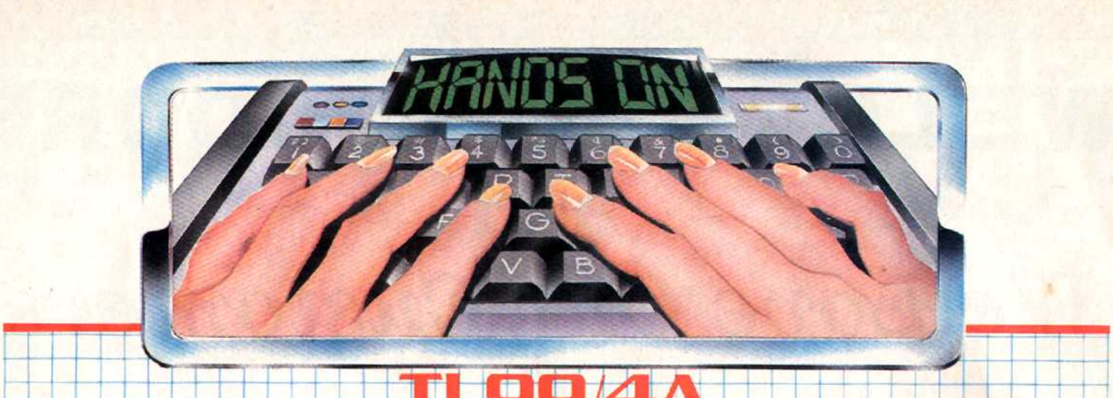

TI 99/4A

One of the most direct and useful extensions of computers involves their ability to generate random numbers. Random numbers are just that: numbers drawn at random as if from out of a hat, by a process that no living being can predict. (Human beings are too full of weird associations and subconscious baggage to make up numbers that are truly random.) In fact, so interconnected are computers and the idea of random-number generation that virtually every personal computer has a randomizing function, and it's listed the same way.

The following program presents the most obvious illustration of random-number generation by your TI. It simply asks you to guess a number from 1 to 100 that the computer has picked at random.

```
1 CALL CLEAR
5 GUESSES = 0
10 RANDOMIZE
20 A = INT(RND*100)+1
30 PRINT "I'M THINKING OF A
   NUMBER FROM 1 TO 100. WHAT
   IS IT?"
40 INPUT Z
50 GUESSES = GUESSES+1
60 IF Z<A THEN 100
70 IF Z>A THEN 120
80 PRINT "THAT TOOK YOU ";
   GUESSES; "TRIES."
90 END
100 PRINT "TOO HIGH. GUESS
    LOWER."
110 GOTO 40
120 PRINT "TOO LOW. GUESS
    HIGHER."
130 GOTO 40
```

The line statements are quite straightforward. Line 20 is the important one. It defines what has to happen for the program to work. Namely, the integer sequence (INT) is randomized 100 times (RND*100). Notice that the expression after the parentheses is "+1." This means that the number 100 is included among the computer's range of choices, but the number 0 is not. (Decimal values like 77.239 are possible in a randomization program, but the INT statement has ruled them out.)

ROLL 'EM

Here is a similar program for the roll of a pair of dice. You don't have to guess anything. Just rejoice in the old 7 come 11.

```
1 CALL CLEAR
10 RANDOMIZE
20 X = INT(RND*6)+1
30 Y = INT(RND*6)+1
40 PRINT X:Y
50 INPUT "PRESS ENTER TO ROLL
   AGAIN":A$
60 GOTO 20
```

Notice that the only functional change from the first program is that the randomization only goes from 1 to 6 (to correspond to the 6 faces of each die). Statistically, you've got a 1 in 12 shot at rolling a given number, and 1 chance in 132 for rolling the 7 come 11. (Your odds go up to 1 in 66 if you don't care about the order.)

LITMUS STRIP

This last program lets the computer use its RND function to generate a sequence of colors at random.

```
1 CALL CLEAR
5 A$ ="FFFFFFFFFFFFFFFF"
10 CALL CHAR (58,A$)
20 FOR T = 32 TO 1 STEP -1
30 COLOR = INT(RND*16)+1
40 CALL COLOR (4,COLOR,8)
50 CALL HCHAR (9,16,58,15)
60 NEXT T
```

Line 5 simply fills up a solid block of color with colons (:). The ASCII code for the colon is 58 (line 10), but you can pick any symbol you want and it will still run in the program. Line 20 locates the color bar (reminiscent, I think, of a litmus strip) on the screen, while line 30 instructs the TI to vary its full set of colors in a random sequence. The numbers 4 and 8 in line 40 select from TI's character set and background color, respectively. You can change them, too, and maintain the sense of the program.

—David Weber

HELP FOR 99ers

Although Texas Instruments has withdrawn from the home computer business, the company says it will provide support for the more than one million TI 99/4A machines that have been sold.

The toll-free helpline—1-800-TI-CARES—continues to operate six days a week, and now takes orders, while inventories last, for peripherals and software.

Registered TI 99/4A owners will receive a quarterly catalog of peripherals and software—including items made by third-party companies. If you sent in your Owner Information Card, you're registered. Or you can register by sending your name, address and 99/4A serial number to: Texas Instruments, PO Box 53, Lubbock, TX 79408. Meantime TI is trying to get other companies to make software and hardware for the 99/4A.

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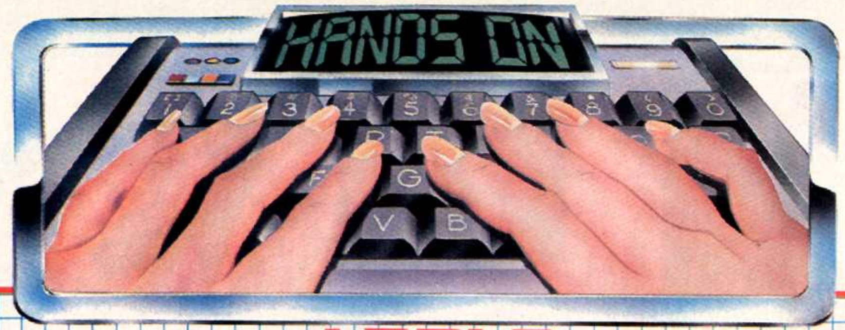

APPLE

Why settle for dull programs when you can add beeps, blinkers, movement and highlights? Applesoft BASIC has some interesting keywords which will let you jazz up your programs.

The usual kind of printing you see on your screen is NORMAL. By using the keyword INVERSE you can make the text on your screen inverse, that is, black or dark letters on a white or light background. Inversing will call attention to the line because the letters are blocked off in a bright rectangle. After the line of inverse, use NORMAL which cancels the INVERSE and makes the next piece of text appear bright on a dark background.

You can make the text you put on the screen flash by using the FLASH before it and NORMAL after it. The FLASH command really gets attention for your words. It causes anything which the computer prints to switch constantly from light on dark to dark on light and back again.

The keywords INVERSE and FLASH do not affect characters as you enter them into the program but they affect the output as the program is run. You can add these commands to a program you have already written, slipping them in just before the line you want to flash or inverse. Note that everything after FLASH will flash and after INVERSE will inverse, until you say NORMAL.

Do not use the FLASH and INVERSE commands too much or they will lose their value and impact. Make only the most important lines flash and use the INVERSE to highlight the next most important information. Here is a simple program to try these keywords:

```
10 HOME
20 PRINT "WHAT COMPUTER DOES
   AN"
30 PRINT: PRINT: INVERSE
40 PRINT "ELECTRONIC ELEPHANT
   EAT?"
50 PRINT: PRINT: FLASH
60 PRINT "BIG BLUE PEANUT!"
70 NORMAL
```

Actually, this program is still not all that interesting because it pops onto the screen as soon as you say RUN. You really want the text to appear about the speed someone could read it. You can change how fast the letters and numbers appear on the screen by using the command, SPEED. After the command you must put the equals sign (=) and then a number. The normal speed of the computer is 255, and you cannot set it any higher.

When you are using the SPEED command, experiment with the numbers up to 255 to see how fast you want the letters to appear. Add these lines to your program:

```
15 SPEED = 100
80 SPEED = 255
```

Run the program and see what happens. Keep adjusting the number in line 15 until you have what you want.

Whenever you use the SPEED command, it's important to bring everything back to normal, even if it's used near the end of the program. Once you set the speed, the computer will continue to put information on the screen at that speed. If you ask it to LIST, the listing of your program will come on the screen at the speed last set. If it is set at a low speed, this can be very annoying.

To avoid the problem, as soon as you have put a SPEED into the program, then write a line near the end to go back to normal. You can stop a slow listing, give the statement directly to the computer, SPEED = 255, and then add a line to the program bringing the speed back to 255.

Put SPEED commands into the elephant program. Have it put the lines on the screen at three different speeds and don't forget to bring the speed back to 255 in the last line.

Another way to slow things down is to tell the computer to count before taking the next step. If you want the pause to be about two seconds, then use this timing loop:

```
FOR N = 1 TO 1500: NEXT N
```

You can substitute any letter for N in the timing loop. This will make no difference but you must change both N's to the same letter. You can change the number 1500 to any number you wish and the number will control the length of the pause. If you want just a brief pause try 500, but if you want to keep everyone waiting, see how long it takes the computer to count to 5000 or higher.

Here is a program that combines the commands that add sound, timing and flash. Notice that the speed is very slow at first, made faster and at the end of the program brought back to normal. Also the screen is brought back to NORMAL. Note that you can go from INVERSE directly to FLASH without a NORMAL between.

```
5  HOME
10 SPEED=10
20 PRINT "WHY SETTLE FOR DULL
   PROGRAMS?"
30 SPEED=70
40 INVERSE : PRINT "WHEN YOU
   CAN GIVE THEM WOW!"
```

```
50 SPEED=150
60 FLASH : PRINT "WITH FLASH
   AND SPEED"
65 FOR Q = 1 TO 1000: NEXT Q
70 NORMAL : PRINT "AND EVEN
   PEEPS!"; CHR$ (7); CHR$ (7)
80 SPEED = 255
```

You can use these commands in making up an introduction to a program you have written. Put the title in the center with your name under it. Use VTAB and HTAB to place the text where you want it. You may have to change the numbers several times before you get the exact placement you want.

Before the title goes on the screen, why not draw a box? This program shows you how to do a very simple box. If you don't want stars or asterisks, you can change the symbols that make up the boxes to %,&,#, + or whatever you like. Try using INVERSE to make the whole box light up. Experiment with the timing loop and have the box pour onto the screen slowly. Or have the box come on fast and the title slowly. Experiment until you have an introduction you like to put at the beginning of each of your programs.

```
10 HOME
20 FOR T = 1 to 38
30 PRINT "*";
40 NEXT T
45 PRINT "*"
50 FOR S = 1 TO 18
60 PRINT "*"; TAB ( 39);"*"
70 NEXT S
80 FOR B = 1 TO 39
90 PRINT "*";
100 NEXT B
110 VTAB 10: HTAB 5: PRINT "THIS
    PROGRAM WAS WRITTEN BY "
120 VTAB12:HTAB 15:PRINT
    "LORETTA HOLZ"
130 FOR X = 1 TO 2000:NEXT X
140 HOME
```

Did you have trouble putting your text in the middle of the box? The last Apple column had information on seven ways of placing text. Here is a program that summarizes those text-moving commands for you.

```
2 REM TEXT MOVING PROGRAM
5 HOME
10 PRINT:PRINT:PRINT "THIS"
20 VTAB 6:PRINT "      IS"
30 VTAB 8:PRINT SPC (8) "HOW"
40 VTAB 10:PRINT TAB( 13)"TO"
50 VTAB 12:HTAB 16:PRINT "MOVE"
60 VTAB 15:POKE 36,20:PRINT
   "TEXT"
```

—Loretta Holz

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TRS-80

You may not have read this in the manuals, but the video screen in the TRS-80 Models I, III and 4 is not a video screen at all. Don't be too alarmed—this is an advantage. The screen is better thought of as a window into memory. Through it, you can see the 1,024 values that are in memory addresses 15360 to 16383. They appear as characters on the screen, but they can be manipulated, just as you can manipulate any memory addresses in normal random-access memory.

You can use this information to create some neat effects. For one, you can change the characters on the screen without printing new values. Try this: POKE 15360, 65. POKE is a BASIC keyword that puts a value into an address—it's like putting an envelope into a post-office box. In this case, the box is the first address on the screen. The 65 is the ASCII code for the character "A" (all characters and control characters are given special numbers), so an "A" appears in the upper left. You can do this with any character, including the graphics characters numbered 128 through 191. Try POKE 15360,191. A solid graphics block is displayed.

Using this video memory, your program can also determine what's on the screen and where. PEEK is the opposite of POKE—it "peeks" into a memory address and tells you the value stored there. PRINT PEEK (15360) should return a value of 191, in this case. A blank space is 32; you might get it if you have already cleared the screen.

Peeking into video memory is often used in arcade games. If the player's ship is about to land on a bomb or on a meteor—that is, if the value of the address in front of the ship is the necessary character—you can create an explosion (perhaps by poking random characters into the block) and end the game. For example, clear the screen and POKE any value into address 15838, about the middle of the screen. Then type:

```
IF PEEK(15838)<>32 THEN FOR G=1
TO 200: POKE 15838,128+RND(63):
NEXT
```

As if this weren't enough, using video memory has several other advantages over printing values. The first is that you don't lose track of the cursor when poking into memory. From within your program, you can peek and poke to your heart's content all over the screen (but not elsewhere; it has been determined that random poking can be hazardous to the health of your TRS-80) and then continue printing right from where you were. If you print everything, though, you have to recalculate your position to return.

You can also POKE a character into the lower right-hand corner without causing the screen to scroll. Something like

```
PRINT @1023, "A";
```

puts an "A" in the 1023rd position (the last one); the semicolon, which usually keeps the cursor on the same line, can't prevent the screen from moving up a line. POKE 16383,65 keeps the screen in the same position.

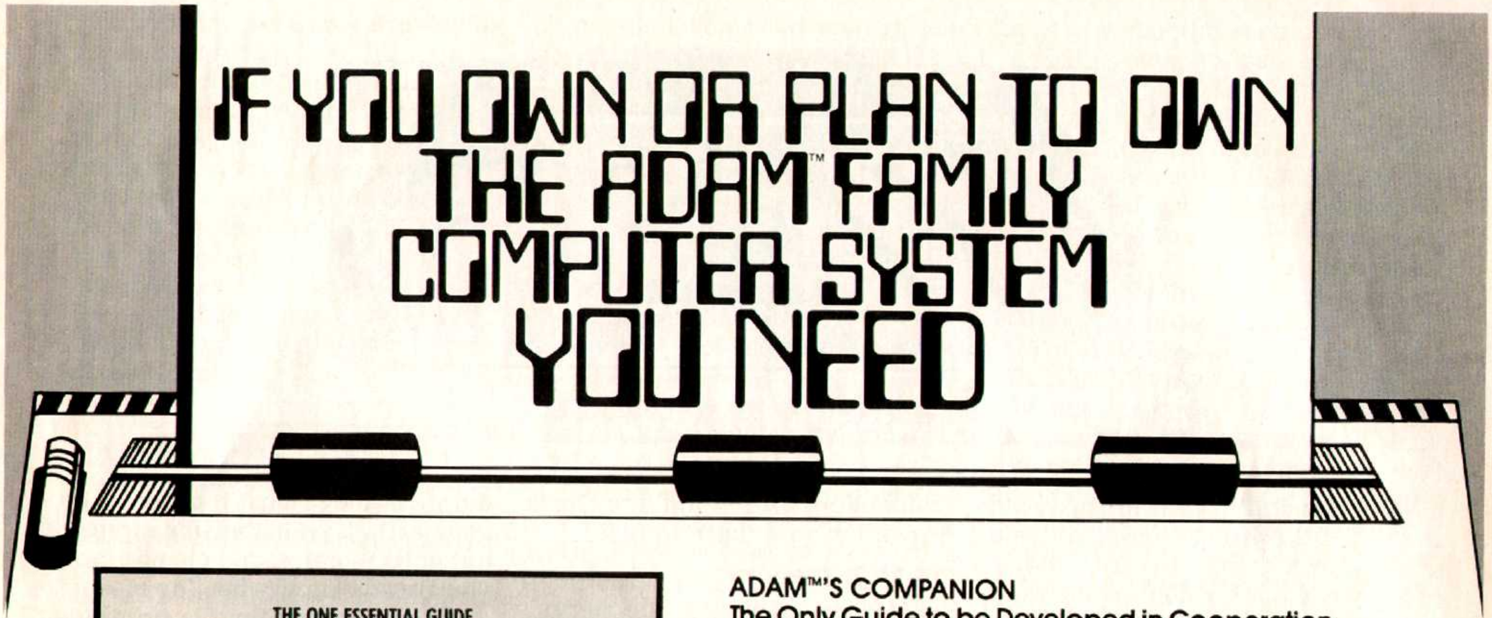
Model III and 4 owners can get a set of 30 extra characters *only* by poking them! The codes from 1 to 31 are used for special things, such as generating interrupts or changing the screen format, so you can't print them. Instead, CLS:POKE 15360,1 to see the first alternate character, for example.

The video memory has been mapped, but it is still worth exploring. Who knows what you might discover?

—David Lewis

Computer Team
2
27
15

"Remember the good ol' days?"



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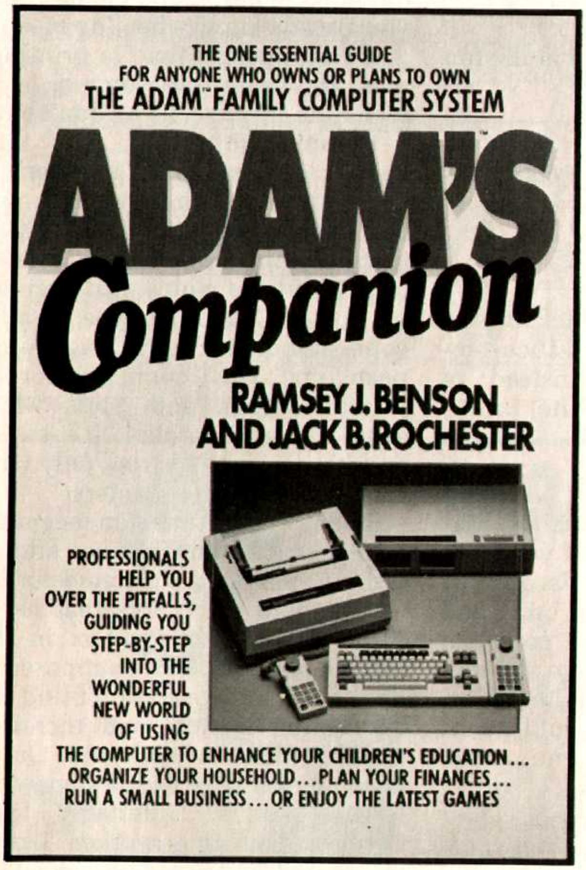

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COMMODORE

If you still have your trusty old VIC-20 sitting around and you want it to start to earn a living, you might try doing some word processing on it. While I'm not particularly wild about the VIC's keyboard—it feels kind of "mushy" to my very spoiled touch-typing fingers—it's really an okay working tool if you have the right goodies to go with it.

Let's start with a good, cheap word processor like Quick Brown Fox. Q.B.F. is a plug-in ROM cartridge which works like any of the game cartridges you may have already played to death. Because it's a plug-in, it doesn't take up any of that very small amount of RAM (3.5K) in the VIC, and uses it to store text instead.

If you have some extra accessories, like a MiniMother expander and a memory expansion cartridge, plug them in and plug in the Q.B.F. on the MiniMother board. This will give you lots of extra RAM to play with, and you'll need it if you plan to do a fair-size term paper for school or something.

One of the first things you'll notice about the Quick Brown Fox cartridge is that it isn't self-starting. When you turn on the VIC, you'll get the usual screen message:

```
****CBM BASIC V2****
19967 BYTES FREE
READY.
```

(The screen says "19967 BYTES" if you're using a 16K expander; in its unexpanded form, the VIC display says "3583 BYTES".)

Now comes the hairy part. You have to get this word processor to start running, and it's easy to miss the fine print in the directions (an extra sheet stuck in the binder pocket) for VIC-20 users. To get out of Commodore BASIC and into Quick Brown Fox, you have to type:

```
SYS 24576 (Return)
```

Then you'll get a prompt at the top of the screen that says:

```
WIDTH (0,4,8)?
```

If you're not using any special 40- or 80-column expansion cards, simply type:

```
0 (Return)
```

You'll then get the Quick Brown Fox heading in rather difficult-to-read white-on-black (instead of VIC's usual black-on-white) print:

```
Quick Brown Fox
(c) 1982
```

Your next step is to hit the "Escape" key. Don't panic if you can't find it. On the VIC, the Escape key has a left-pointing arrow on it, and it's on the far upper-left corner of the keyboard—right where any self-respecting escape key should be. When you hit this key, you'll get the Quick Brown Fox's menu which looks like this:

```
...Quick Brown Fox
Type
View
Print
B.View
G.Edit
L.Edit
Move
Delete
Zap Memory
Send
Receive
Clerk.?
```

The cursor will be blinking away at you next to the Clerk.? All you need to do to start writing is hit the letter "T" (for Type).

An unusual menu item—Zap Memory—is used so there's no question about what it means. The manual tells you that it's straight out of the comics, and chances are, you already know what *Zap* means.

When it comes time to print out what you've written, you may be in for a rude surprise. If you don't have a Commodore printer, you may have to do some fancy footwork.

We tried out the Quick Brown Fox using a Star Micronics STX-80 thermal printer which sells for $170 to $199 in the stores. This printer has just a Centronics-type parallel connector on it. The VIC has a European type (DIN) connector for its printer output, and guess what, gang? It's not parallel, it's serial, and it's designed to work only with Commodore-brand printers.

Japanese and American ingenuity have come to the rescue, after a fashion. Star makes a connector for Commodore computers that has a little plastic interface box in the middle of the cable. It's supposed to do the job, but we couldn't find the instruction manual and therefore couldn't get it to work with Quick Brown Fox. So we tried a somewhat larger printer interface from CardCo. This one worked like a charm, but it needs some special instructions.

You plug it all in, turn on the printer and the VIC, and before you call up the Q.B.F., you type (under the word "READY."):

```
OPEN4,4 (RETURN)
CMD4 (RETURN)
PRINT "CARDCO, INC." (RETURN)
```

This last line will get your machine to print out, "CARDCO, INC." You don't really need this, but it's nice to know that the darned thing's working.

Once you have the printer turned on and ready, then you can type the

SYS 24576 to get Quick Brown Fox up and running.

If it all sounds terribly complicated, it's simply because the VIC-20 wasn't originally designed to be a business machine, and word processing just wasn't in any designer's mind when they were dreaming up this computer three or four years ago. Besides, they probably figured they could get people to buy Commodore printers with all the special goodies inside.

UNWRAPPING THE 64

After cutting your eye teeth on the VIC-20, the C-64 seems almost like too much computer. After all, there's a big difference between the 39K of RAM available on Big Brother and the measly 3.5K in the VIC. That's more than 10 times as much user memory!

One of the least-understood special features under the C-64's hood is its multi-sprite generator.

Forget that Sprite is a soft drink. In computers, it's a very special kind of graphics element. If you own an Apple—not a cheap machine—and you want sprites, you have to shell out $200 to $300 for a circuit board that will generate them.

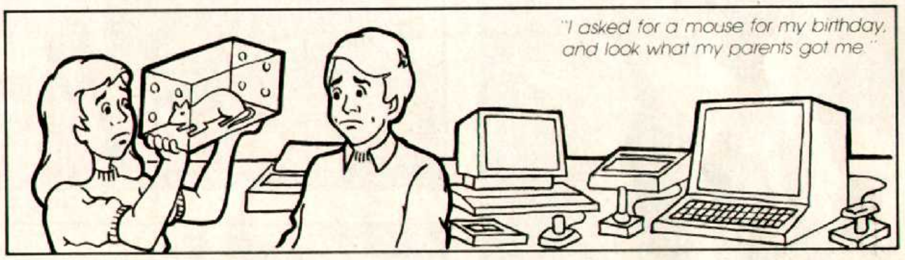
If you own a Commodore 64, you already have a microcircuit built in that will generate eight separate sprites. All things considered, that's quite a bargain—and probably one you didn't know about when all you thought you wanted from the Commodore 64 was the machine's bigger memory.

A sprite in the C-64 can be a single pixel (the smallest "particle" or part of a TV picture) or it can as big as 320 dots wide and 200 dots deep on the screen. You can use the sprite in any mode—text as well as graphics. You can make your sprites different shapes and colors and you can make them move in front of or behind each other.

When you generate a sprite, you can change its size with a POKE command. Why all the fuss about sprites? For one thing, the chapter in the C-64 manual that deals with these wonderful graphics elements is short, and you may not appreciate just how important sprites are. Don't breeze through it, but read it carefully, and try it out.

If you want some more information on C-64 sprites, we'd suggest you buy the book, "Commodore 64 Exposed" by Bruce Bayley. If you can't find it in your bookstore, the publisher is Melbourne House Software, Inc., 347 Reedwood Drive, Nashville, TN 37217. It contains several sections on sprites and how to use them.

—Walter Salm



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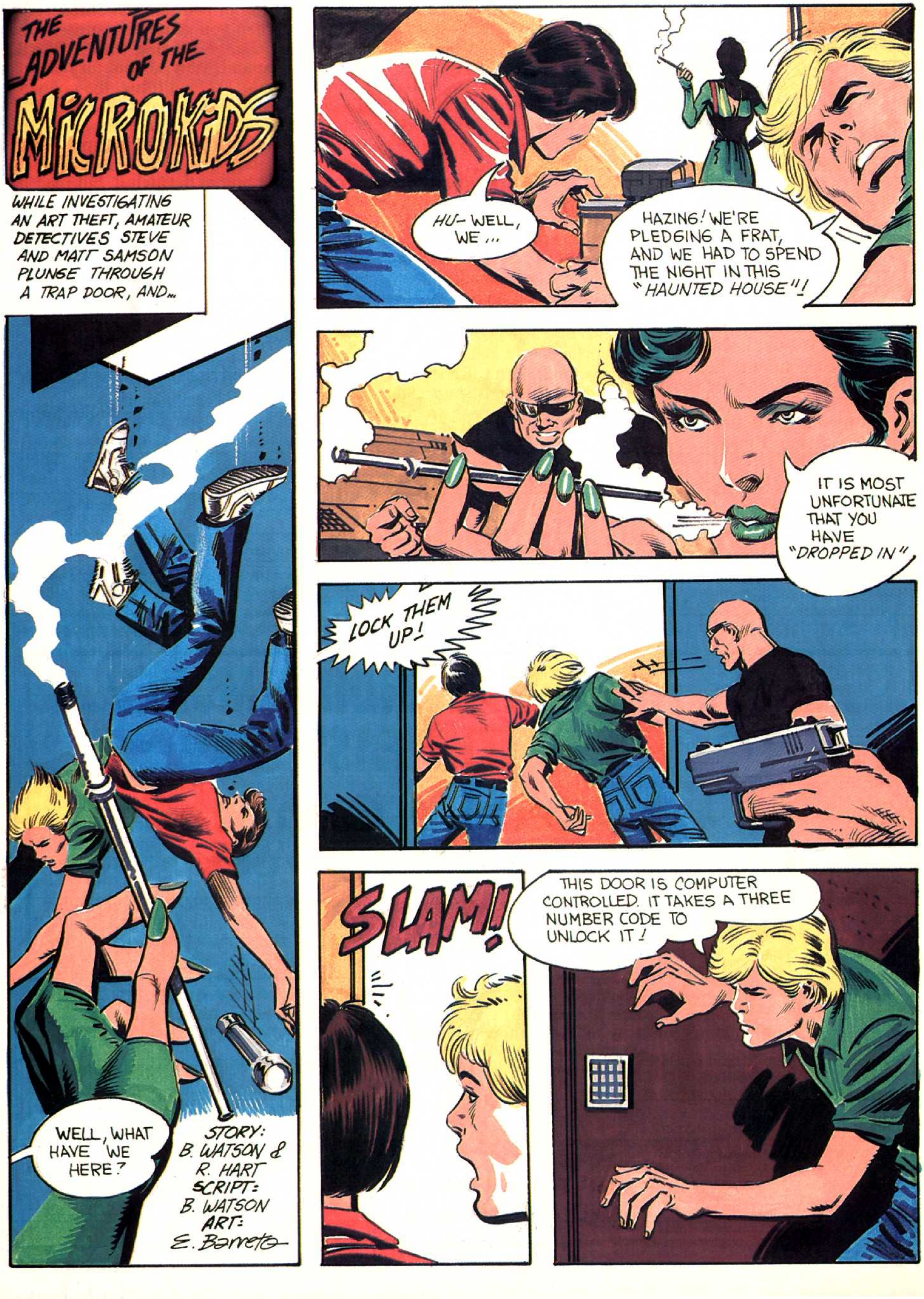
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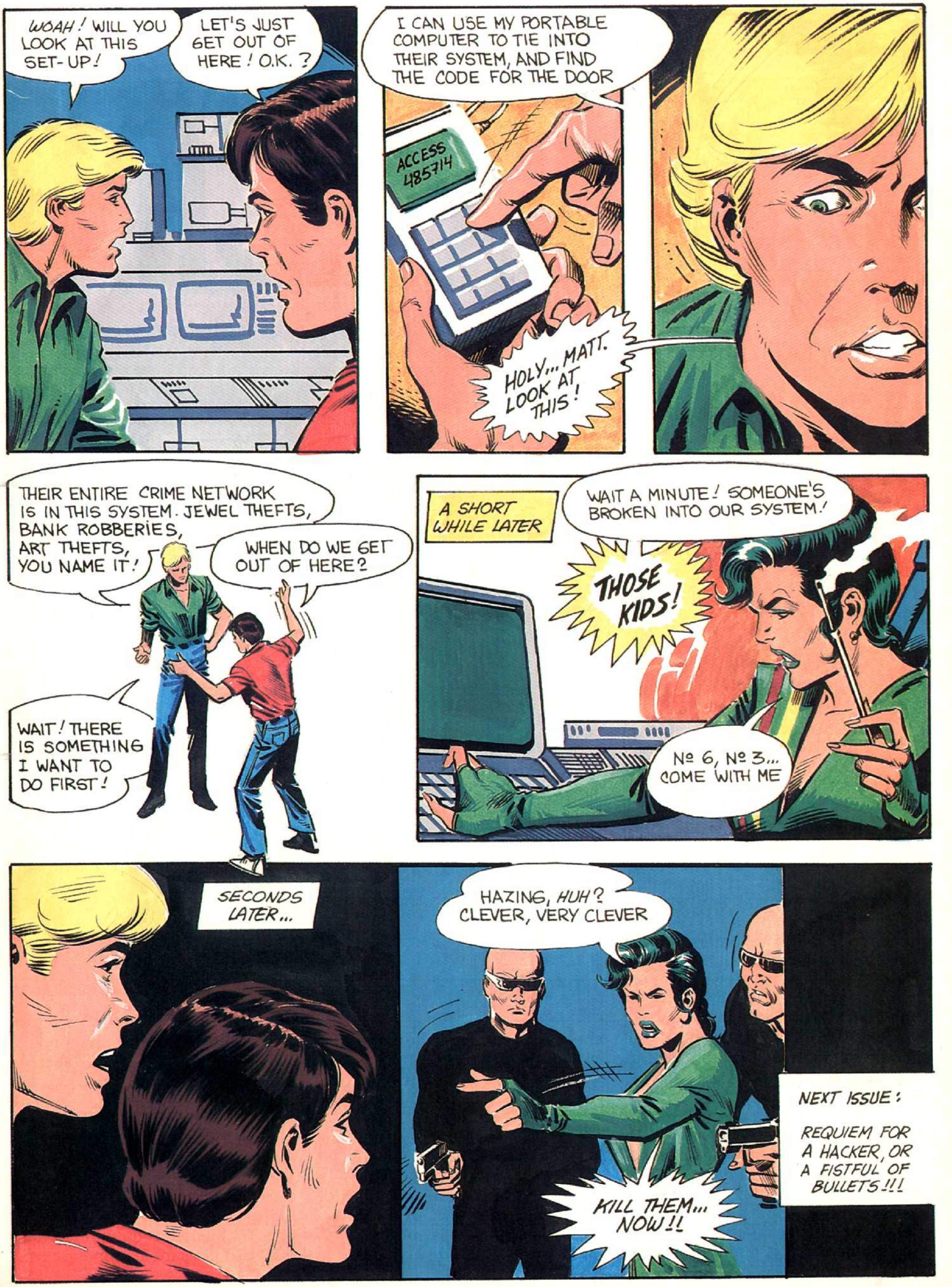
WHILE INVESTIGATING AN ART THEFT, AMATEUR DETECTIVES STEVE AND MATT SAMSON PLUNGE THROUGH A TRAP DOOR, AND...
WELL, WHAT HAVE WE HERE?
STORY: B. WATSON & R. HART
SCRIPT: B. WATSON
ART: E. Barreto
HU- WELL, WE...
HAZING! WE'RE PLEDGING A FRAT, AND WE HAD TO SPEND THE NIGHT IN THIS "HAUNTED HOUSE"!
IT IS MOST UNFORTUNATE THAT YOU HAVE "DROPPED IN".
LOCK THEM UP!
SLAM!
THIS DOOR IS COMPUTER CONTROLLED. IT TAKES A THREE NUMBER CODE TO UNLOCK IT!


WOAH! WILL YOU LOOK AT THIS SET-UP!
LET'S JUST GET OUT OF HERE! O.K.?
I CAN USE MY PORTABLE COMPUTER TO TIE INTO THEIR SYSTEM, AND FIND THE CODE FOR THE DOOR
ACCESS 485714
HOLY... MATT. LOOK AT THIS!
THEIR ENTIRE CRIME NETWORK IS IN THIS SYSTEM. JEWEL THEFTS, BANK ROBBERIES, ART THEFTS, YOU NAME IT!
WHEN DO WE GET OUT OF HERE?
WAIT! THERE IS SOMETHING I WANT TO DO FIRST!
A SHORT WHILE LATER
WAIT A MINUTE! SOMEONE'S BROKEN INTO OUR SYSTEM!
THOSE KIDS!
Nº 6, Nº 3... COME WITH ME
SECONDS LATER...
HAZING, HUH? CLEVER, VERY CLEVER
KILL THEM... NOW!!
NEXT ISSUE: REQUIEM FOR A HACKER, OR A FISTFUL OF BULLETS!!!

MACIN

A quick look at Macintosh reveals a lack of several key features for home computing use.

BY WALTER SALM

In case you've been just dying to run out and plunk down your hard-earned summer-job money on a new Macintosh computer, we have some advice—slow down. Apple's newest wonder child is a beautiful, well-crafted, state-of-the-art *business* computer. Some day, it may also be a good all-round computer for the home. But it's missing several key ingredients for home and hobby use right now. It's not color—it won't drive a color TV set or monitor. There are no joystick ports, and the only software available for it is business- and management-oriented.

But little Mac is a powerful lot of computer, and even though it won't play Gorf or M.U.L.E. or Preppie or Q-Bert, it will do a lot of other things for your dad in his office.

Little Mac is really little—computer people like to say it has a small "footprint." It's not only small, but it's light—at 19½ pounds (processor, keyboard and mouse), it's far lighter than most of the business "portable" computers. One of the accessories you can buy for the Mac is a canvas carrying bag, which appears in a lot of Apple's advertising these days. So don't be too surprised if Mom or Dad brings a Mac home for the evening from the office. If that happens, here's what the Mac will do for you.

First of all, it has a 9-inch monochrome screen built into the main computer box. Below the screen is the disk drive, which uses 3½-inch *microfloppy* diskettes—just like the ones used in Apple's Lisa computer. These are pocket-size disks with a very hard jacket and a protective shutter so you can't hurt the disk surface when it's out of the computer. They tell you to put it in your shirt pocket because it's so small and so well protected.

The Mac gets up to 400K on one of these disks, which is a whole lot of software and data files. There's a jack on the back of the machine for adding another disk drive if you need one. In business offices, having two disk drives on a computer is almost always a must situation.

The keyboard is very businesslike and good for writing programs and doing word processing. But once you've finished using the keyboard, you can push it aside and do everything else with the little Mac's mouse.

In case you've never used a mouse, it's a neat controller that does for business computers what a trackball does for arcade-type com-

TOSH

UP CLOSE AND PERSONAL

Photo courtesy of Clancy Paul Microcomputer Learning Center.

puter games. You move it around ever-so-little on the desk top and the cursor moves on the screen—just where you want it to. A square controller *fire* button on the mouse locks in on a particular item after you've located it with the cursor on the screen.

What would you lock in on? Menus, for one thing—and almost all of them use *icons*—a picture that represents one of the computer's features or operations. In the MacPaint program, icons show pictures of various shapes and pen points you can use, an eraser, a paint brush, a hand (for picking things up and moving them), and a lot of patterns, cross-hatching, and shades of gray. Along the top of the screen are a few menu choices that are printed in English instead of pictures. These are: "File, Edit, Goodies, Font, FontSize, Style". Like the icons, you pick these out with your mouse-controlled cursor.

Using the mouse, you bring the cursor over to the icon that shows a picture of an eraser, and you push the button, and then can use the mouse to erase selected parts of the picture or typescript on the screen.

You can do such things as copy files or parts of files, you can juggle them, cut and paste, duplicate, rotate (pictures and graphics), enlarge, reduce, reassemble in different order—if you can think of it, the little Mac's mouse will let you do it.

Okay, so it's no good for playing games—at least right now. But inside that machine is more computing power than some of the big mainframes had only a few years ago. The Mac uses a 32-bit microprocessor—that's four eight-bit bytes at a time—and that means that it can work directly with really huge amounts of memory somewhere down the road. For now, the Mac comes with 128K of RAM and 64K of ROM—which is a lot of screen mapping and built-in software.

The Mac's screen is supposed to be the top of your desk—whether it's in an office or in your bedroom. If you need one, the screen will show you a memo pad with corner turned in to make it easy to flip the pages. You can pull in a pocket calculator (all on the screen) and use it with the mouse controller. There's even a trash can for throwing away things you don't need. And if you discard something by accident, it's not lost (the garbage truck comes around very, very late). You can poke around in the can and retrieve whatever it was you threw out.

MACINTOSH

The Mac will work with most printers, but it works best with Apple's own *Imagewriter.* This is a hi-res dot-matrix printer that handles many different kinds of type styles and sizes and prints any graphics or drawings you send to it. And drawings there will be if you use the Mac.

One of this computer's special features is the fact that you can plug in almost anything from anything—mix and match files, take a letter and put a chart or a drawing in the middle of it—really neat tricks at every push of the mouse.

It's only natural to compare Macintosh with Apple's Lisa—a high-level business computer that was terribly overpriced and is now down at reasonable dollar levels ($3,500 and up). Both Mac and Lisa are 32-bit machines. Both use a lot of *windows*—sections of the screen that let you look at another file or program in the middle of the one you're working on. And the new Lisas use the same 3½-inch disk drive that's in the Mac.

Part of the whole concept is to make the Mac a "Little Lisa" or Lisa a "Bigger Mac." They'll talk to each other, exchange software and be networked in any office.

Also on shelves now is the new Apple modem and its software. It comes in both 300- and 300/1200-baud versions and will work with all Apple computers.

In case you're wondering if the Mac is a brand new computer in search of software to run on it, wonder no longer. Apple did something very smart. Besides doing their own system software for the Mac, Apple has been working with over 200 software companies on Mac projects, and at least 75 of those companies have come through with really dynamite software.

One of the biggest—Microsoft, which is the same company that designed the original operating system software for the IBM PC—expects to do at least half of its business this year in Macintosh software. Now that's a lot right there.

Everybody's got something going for Mac, and now that Mac and Lisa are members of the same 32-bit family, there'll be a lot of programs and file-swapping back and forth.

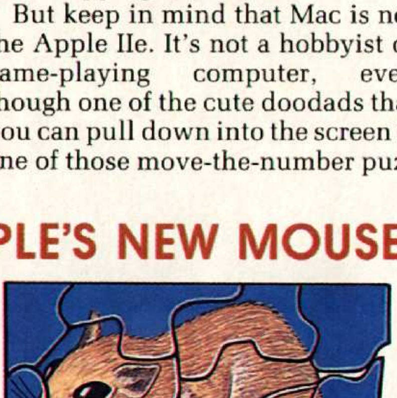
But keep in mind that Mac is not the Apple IIe. It's not a hobbyist or game-playing computer, even though one of the cute doodads that you can pull down into the screen is one of those move-the-number puzzles. (They figure that you need a little relaxation once in a while, and most desks have some kind of gadget or plaything on them.)

Will there be real games for the Mac? Probably. Eventually. When the games come, they'll be in monochrome and they're likely to be text-type games that don't use a lot of splashy color. They will no doubt have you use the mouse to choose options, directions, etc. But gameplay is not high up on the list of software priorities for the Mac right now.

A ton of new software hitting the streets in the next few months will be Mac/mouse adaptations of business favorites like MultiPlan, Lotus 1,2,3, all the PFS programs, tax and menu planners, accounting programs—the kind of stuff that business people will appreciate. In the meantime, if you get a chance, you might just want to try out some of the things you can do with Mac. It'll help you do some really great term papers, organize your notes, print up some excellent pictures for your lab notes in biology and physics, etc.

So all's not lost. The Mac is great. And it may be for Microkids, eventually, after all! ■

APPLE'S NEW MOUSE KIT



If you like the idea of the Macintosh mouse but don't want to junk your Apple IIe or II+, take heart. The Mac's makers have come out with a mouse you can call your own—complete with plug-in circuit card. For $149 you get a mouse and a circuit card plus the first piece of software called MousePaint.

With the mouse and card installed inside your Apple, you can use your new mouse kit and MousePaint software—with its picture/icons, pull-down menus and lots of other goodies—very much as if your machine were a Macintosh.

The controller card contains its own microprocessor chip and some firmware (software in permanent ROM) that lets it talk to programs that are written in BASIC. If you want the mouse to do something different from what's available in MousePaint, there will be more software coming out from Apple and from third-party software companies as time goes on. Or you could write some of your own mouse programs in Applesoft BASIC.

The only complication with the new mouse kit is the fact that the circuit card goes into good old slot No. 4 in the computer—the slot that *everybody* seems to prefer for their particular plug-in card. You can use a different slot, but you have to make a small change in any BASIC programs that you write for the mouse. And when you call the mouse, you type PR# 5 (if it's in slot number 5, for example) instead of the PR# 4 that's called for in the manual.

The controller card has about six inches of flat ribbon cable that goes to a nine-pin jack. The jack looks like the paddle port on the back of the IIe, but the similarity is only skin deep. The jack gets clamped into place in the middle of the back of the computer, and that's where the mouse plugs in. The installation should take maybe about 10 minutes. ■

MAN FRIDAY...

HOW TO GET YOUR OWN ROBOT

BY VINCENT PUGLIA

If you've always wanted your own robot, it looks as if you may at last be able to get your wish. 1984 seems to be shaping up as the year of the robot. The summer season is seeing more robots than video games fill up the computer store shelves, almost. And predictions are that robots will be *the* hot item in the coming Christmas season.

Some of the robots walk, some talk, some perform other tasks—play games, songs, pick up and carry objects, turn on electrical devices, act as fire and burglar alarms and even vacuum the house. They range in price from $12,000 to $79.95. But before you run out to buy your own Man Friday, there are some details you ought to know.

All the robots we refer to here are personal robots (as opposed to industrial robots), and they are divided into two types. One type is like videogames. They are closed—or dedicated—systems. The limited number of things they're programmed for—such as walking and talking—they do fairly well. But, they are unable to do anything else. If the ability to interface wasn't designed into these robots, they cannot be connected to an outside appliance.

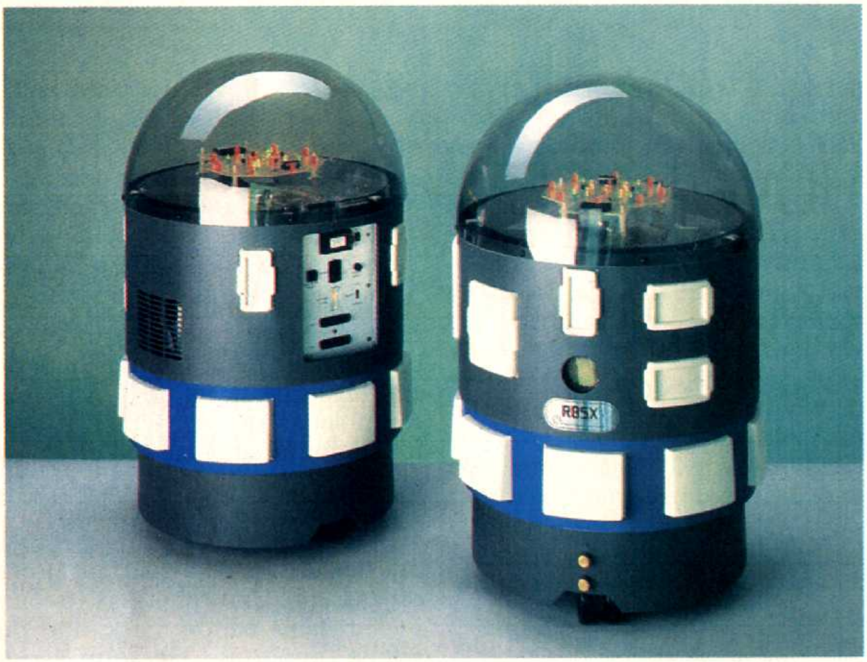
Other robots are more like computers. They're open—or task-oriented—systems. The user can program them with a computer to do things he wants, or expand them with optional hardware and software.

Perhaps the most famous robot today is HERO I, from Heathkit. This fully-programmable, three-wheel robot comes with an onboard computer, an arm with gripper, a voice synthesizer and a complement of sensors. With the gripper, it can lift and manipulate small objects. The voice chip lets HERO speak words and sentences. And the sensors are so good the robot can distinguish light, sound, motion and obstacles in its path. An ultrasonic sonar system, which it uses for determining range and direction of objects, is standard.

Programs are entered into HERO 1 either through a teaching pendant or a hexadecimal keypad and stored on cassette. The robot has its own rechargeable battery pack, and the whole thing, in kit form, costs $1,500. A fully assembled HERO 1 costs $2,495. That's pretty high for something to walk the dog.

Androbot, the company founded by Nolan Bushnell (the man who begat Atari), has three robots to offer. B.O.B. is Androbot's high-end robot. Designed for engineers and institutions, B.O.B. costs $5,000 and comes with three megabytes of operable memory built in. Topo is more modest in price and capabilities. Selling for $1,595, Topo operates through a home computer via infrared link and is programmed for movement, speed and speech by joystick or keyboard using Toposoft, a Forth-based language. Among the options available or planned are touch sensors to allow Topo to navigate around obstacles, an infrared bar-code reader and a form of Logo. At the time of writing, Apple Topos were available, with Atari, Commodore and PC versions in the works.

Third from Androbot is F.R.E.D., for $350. F.R.E.D. can operate through a computer or a remote infrared controller. Besides a voice chip with a 45-word vocabulary, this 12-inch robot is equipped with down-looking sensors so it can't fall off anything. F.R.E.D. comes equipped with a little wagon and a writing arm. At present the arm



RB5X can vacuum the house, fetch the paper, carry a fire extinguisher. It comes with on-board microprocessor and sports two RS-232 ports.

HERO I, from Heath, may be the most famous robot. It comes as kit.

MAN FRIDAY

hold only a felt-tip marker, but other accessories are planned.

From The Tomy Corp. comes Omni-bot, for $200. This 17-inch robot walks, talks (via cassette) and operates under radio control or microprogramming. It has a built-in alarm clock, carries objects on a detachable tray, and lifts small objects. It also has a rechargeable battery and recharging unit.

Then there's the Memocon Crawler, from Stock Model Parts, at $79.95. The 4K-RAM, turtle-like robot (5½ inches diameter by 2½ inches high) may not have all the bells and whistles of the big boys, but it is impressive. Through its pendant, Memocon Crawler can be programmed to move forward, turn, pause, sound a buzzer, light a LED lamp, or repeat a program. Most important, it can be connected to any home computer through a parallel interface.

If you want to curry favor with Mom and Dad, pick up an RB5X, by RB Robot Corp. It costs $1,795, but it can vacuum the house, fetch the paper and carry a fire extinguisher. The RB5X comes with an on-board microprocessor, self-learning software, Tiny Basic, a sonar sensor to detect objects, eight tactile sensors to help it navigate around them, and two RS-232 ports. The 23-inch-high robot can recharge itself or shut itself down when its energy level is very low.

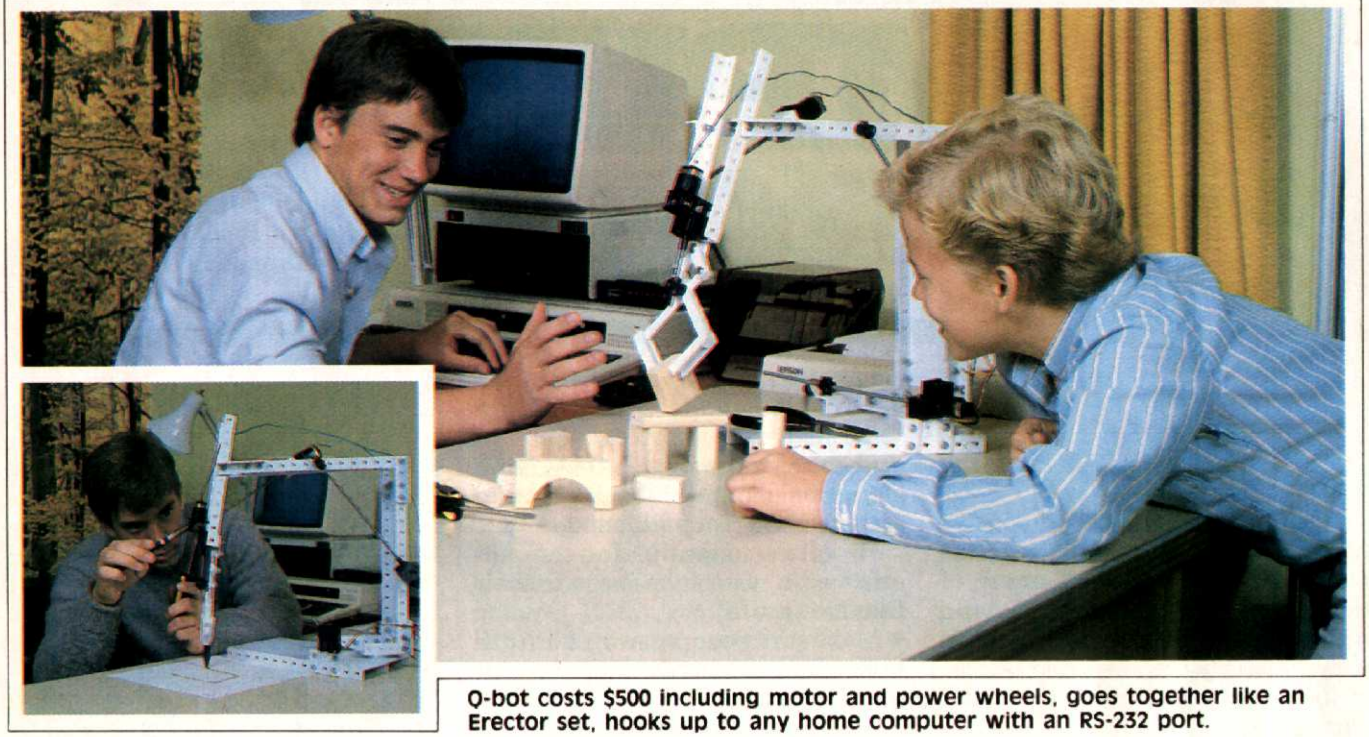
Because the RB5X has four empty slots for circuit cards, hardware attachments can be specially designed for it. Among options presently available are: an arm capable of lifting 16 ounces, a voice/sound synthesizer, a voice-recognition command module for Apple II+ and a robot control language with savvy.

This language is probably the most user-friendly programming language in existence. Besides being almost English-like, it allows for human error. For example, the language recognizes typos and executes the command as if the correct spelling or sequence were given.

If you shop at big department stores, you'll probably see Hubot, from Hubotics, selling for $3,495 . . . in the appliance department. Hubot comes with a 128K computer, 5¼-inch floppy disk drive, detachable keyboard, printer, CP/M operating system and RS-232 communications connections. It incorporates a 12-inch, black-and-white TV, an AM/FM stereo cassette player and an Atari 2600 videogame system. Eventually, owners will be able to add other features to Hubot, including an arm, a fire and smoke detector and a Smart Servant module, which will enable Hubot to control all the electrical appliances in the home.

The Robot Factory offers three robots. There's the Hot Tot Robot, entirely covered with imitation fur, equipped with a bicycle, tricycle or motorcycle, and whose mouth can be made to synchronize with its speech. Prices range from $3,750 to $4,500. And there's the Videobot ($12,195), which comes with a color VCR, a monitor and a camera. Both are radio controlled and come with wireless microphones.

The third robot from the Robot Factory is called Robodroid. It is 32 inches high, and has its own 6502 microprocessor with 64K RAM and 28K ROM. There's a full keyboard,



Q-bot costs $500 including motor and power wheels, goes together like an Erector set, hooks up to any home computer with an RS-232 port.

eight I/O ports, an RS-232 interface and Robot Extended Basic.

Q-bots, from Eastern Machinery and Manufacturing, are among the most ingenious robot kits available. Similar to an Erector set, each kit can be assembled in a variety of ways. Included in the $500 kit are motor and power-wheel assemblies, light and magnetic sensors, and a claw. Since the kit has no microprocessor, a home computer is necessary. Any computer with an RS-232 printer port will do. Among suggested projects: building of an arm capable of lifting two pounds, construction of a vehicle that follows a white line, the automating of a vacuum cleaner.

From Ideal Toy Co. comes Maxx Steele. The two-foot high, $300 robot is mobile and has arms. It can be controlled by radio or programmable memory, and comes with a 150-word vocabulary and a radio remote-control keypad. His back conceals a built-in compartment; his wrist, a searchlight. In addition to playing music, Maxx plays a form of tennis with light.

And finally comes what may be the most interesting robot of all. It has been reported that while Nolan Bushnell's company, Androbot, was working on some infrared technology some months ago, the company was also developing a robot that played a game called Sleuth, which was like an established board game named Clue, and which required the player to go through different rooms searching for clues. Named Androman and driven by an Atari 2600, the robot went through different sections of a 4x7-ft. playing surface, searching for clues. Among the robot's features were said to be infrared-link technology, joystick control and infrared optical bar code readers.

Now, gossip of the marketplace says that all rights to Androman have been sold to Atari, that Atari is feverishly getting Androman ready for retail marketing, and that Atari will announce its new robot to the public this summer, when he will be renamed Atariman.

Unfortunately, Atari no longer admits to having products unless they are being shipped. "We promised too many things in the past that were never delivered," say Bruce Entin, of Atari. He does admit that Atari and Androbot entered into an agreement to produce and distribute a joint product. But the product is not named. ■

Robot Makers

Androbot, Inc.
101 East Daggett Drive
San Jose, CA 95134

Eastern Machinery and Mfg.
850 South West Temple
Salt Lake City, UT 84101

Heath Co.
Department 150-055
Benton Harbor, MI 49022

Hubotics, Inc.
5375 Avenida Encinas, Suite B
Carlsbad, CA 92008

The Robot Factory
Box 112
Cascade, CO 80809

RB Robot Corp.
18301 West 10 Ave., Suite 310
Golden, CO 80401

Stock Model Parts
Designatronics, Inc.
54 South Denton Ave.
New Hyde Park, NY 11040

Tomy Corp.
901 East 233 St.
Carson, CA 90749

The COMPUTING CROWD

Teenage computerist Neal Patrick is back home in Milwaukee "writing programs here and there" after a few weeks of celebrity last fall. Neal was a member of the 4-1-4s, a group of teenagers from Milwaukee who made national headlines in August when federal agents arrested several of them and seized some computer equipment.

Neal, 17, was one of the teenagers arrested for using the Telenet network to gain access to several private computer systems across the nation. He later testified in congressional hearings on computer security problems.

Neal said the group broke into the systems out of curiosity, not because they intended to damage the systems or use the information. But he called the congressional hearings and newspaper and television stories on computer security a good response to a real problem.

Neal Patrick testifies on hacking.

He offers some tips for computerists who want to make sure their files are secure:

- Make sure your passwords are different from those the program's author assigned.
- Change passwords often.
- Be aware of how hackers could break into the system, and monitor the system carefully for signs of unauthorized entry.

Back at home in Milwaukee, Neal awaits acceptance from Northwestern, Brown and Rensselaer. He's got a sense of humor about the recent events, though, which were a little frightening at first—Neal says he finds the Bloom County comic strip on young computer hackers "extremely funny."

Look for books number 13 and 14 from whiz-kid author Tim Knight. Number 13 is *Probotech*, for personal robotic technology. Number 14 is titled *Eureka! on the IBM PC or PCjr. Eureka* provides hints for writing programs on the IBM machines, and includes a game program and a collection of PC utilities.

But don't hold your breath for any more books from Tim Knight. "A lot has changed recently," Tim told **Microkids**. Tim also has his own software company, but he said software has been "kind of slow lately."

"I'm really planning to phase out software and the book writing," Tim said.

What's he giving up software and book authorship for? The title of book 13 provides a clue. Tim says he's really become interested in personal robotics lately, and he hopes to spend more time working with hardware and robots in the future. In the meantime, he's waiting to hear from Stanford University, where he hopes to enroll in the fall and continue his computer work.

He could have endorsed any product from pudding bars to sports cars, but Alan Alda chose to be spokesman for Atari computers. After the M*A*S*H series that made Alda and his TV character Hawkeye household words left the air with a bang, Alda was approached to hawk scores of products.

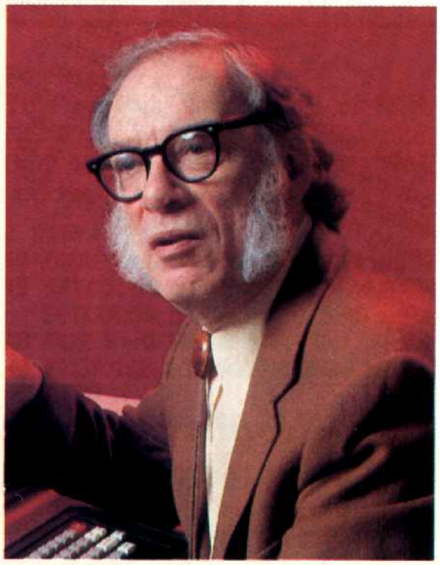
But Alda, who also has become known for his active involvement in political and social movements, was leery of lending his name to products he didn't really believe in. What one product finally did get the Alan Alda seal of approval? Atari home computers. Just how sincere is Alda in his support of Atari? Very. Alda says he has an Atari at home that gets regular use by the whole Alda family.

And Alda reportedly agreed to do the Atari commercials only if he kept complete creative control of their message.

You might have guessed that Isaac Asimov, author of hundreds of scientific texts and high-tech science fiction stories, would compose his works with the help of a micro. Now that he's appearing in Radio Shack advertisements, you know that it's a TRS-80 he uses. He's been writing with his Model 2 since 1981.

Asimov says the word processing program he works with helps him to produce neater, more carefully revised manuscripts. The biggest advantage of using the computer, he says, is that he's not as tempted to submit unedited manuscripts to avoid the tedious process of retyping many pages.

In spite of his high-tech writing aid, however, Asimov is still notorious for the amount of time he devotes daily to his writing. "One thing the computer cannot do is make me write faster," Asimov says. "Nothing can change the speed at which I write."



Isaac Asimov writes on a micro.

Asimov uses his computer strictly as a writing tool so far. "I am a full-time writer," Asimov says. "Perhaps if I had the time I might be interested in computing for computing's sake, but right now I just don't have the time."

Two new game designers you'll be hearing about are 18-year-olds David Simons and Tom McWilliams. Simons is the English creator of Simons' BASIC for the Commodore 64. He says computers are "a very in sort of thing" in England. "They've really taken over from video games."

Simons is no newcomer to microcomputers, however. Simons' BASIC, which some reviewers think is the best language extension ever written, is only one of many Commodore projects David has completed. He began working with a VIC-20 when he was thirteen. Soon, he was working with a local dealer to improve its sound and some other qualities. When they saw the results, Commodore asked him to work on BASIC. He wrote Simons' BASIC in about nine months when he was sixteen. Now he's completing Simons' BASIC II to solve some problems not quite solved in Simons' BASIC.

The first game from Tom McWilliams ought to be on the shelves at your local computer store now. Tom has been working full-time designing games for Imagic, the third largest video-game producer, since September. He attends a California junior college part-time.

Tom's Laser Gates for the Atari 400 is a new version of a familiar Imagic game, but he's been designing his own games for four years, and working with computers for five.

"I was really interested in electronics before there was such a thing as microcomputers," Tom says. "I built robots before I worked with computers, but I began writing programs because it doesn't cost any money. With robots you always have to buy more parts."

Whiz Kids Turn Up in the Strangest Places, Part I: Would you believe on the rock 'n' roll stage? Singer/songwriter Todd Rundgren is known mostly for his singing and writing talents and for his sometimes extravagant stage performances. Those who have seen Rundgren offstage, however, know that he has a second big love, next to music: computers and electronics.

Rundgren's hobby even predates the popularity of microcomputers. Rundgren originally became interested in computers as a way of developing music. Rundgren is known in electronic and music circles as developer of the digital light organ.

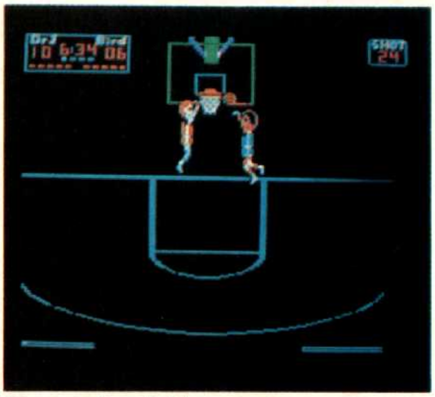
Rundgren's Utopia video studio was a video pioneer, one of the first to realize the new form of entertainment that could be created with a combination of music, drama and electronics. A spokeswoman says Rundgren is almost always at work on a new programming project, mainly having to do with music. He also speaks regularly at meetings about computer sciences.

Whiz Kids Turn Up in the Strangest Places Part II: Would you believe on the basketball court? Electronic Arts, a San Mateo, California, software manufacturer, has decided software authors may be as important as programs themselves when it comes to big sales. And one of their recent offerings is a one-on-one video basketball game that pits the 76ers' Julius Erving against Boston Celtics star Larry Bird.

Julius Erving and Larry Bird.

Electronic Arts designer Eric Hammond met with Erving and Bird to discuss the moves each player would make against the other in a game of one on one. Dr. J and Hammond even traveled to the San Mateo YMCA so Hammond could take a look at the legendary moves in action. A photographer took freeze-action shots for Hammond to refer to.

After a preliminary design was completed, Dr. J went through the game with Hammond to refine the moves. The resulting game includes effects such as fatigue and shooting streaks and slumps. And a company spokeswoman reports that Dr. J and Larry Bird, when they're not trading elbows under the blackboard, can be found occasionally at the computer keyboard. ■



"One-on-One" video game.

GRAPHICS MAGIC

You don't have to be an expert to get good results from your computer. You can type these programs into your machine and run them immediately to produce some great graphics magic. More advanced micro users can have fun translating the programs so they'll run on other machines. And if you write your own original graphics program and want to share it, send it to us. If we publish it, we will pay you $25.

Tubes & Grids

For Atari

This ingenious program first draws a grid on your screen. Then it adds three cylinders—three-dimensional in look, in front of the grid.

```
0 REM TUBES & GRIDS
10 GRAPHICS 9:SETCOLOR 4,8,0:
   Z=1: GOSUB 1000
15 FOR TUBES=1 TO 4:W=W+8
20 FOR LT=0 TO 15 STEP 1,2:
   COLOR LT:TRAP 90
30 PLOT Z, 20-LT+W: DRAWTO
   Z,150+RT+W:Z=Z+1
40 NEXT LT: REM *** LEFT HALF OF
   TUBE
50 FOR RT=15 TO 0 STEP -1.2:
   COLOR RT
60 PLOT Z, 20-RT+W:DRAWTO
   Z,150+RT+W:Z=Z+1
70 NEXT RT:REM *** RIGHT HALF
   OF TUBE
80 Z=Z+1: NEXT TUBES
90 IF PEEK (53279)=6 THEN RUN
95 IF PEEK (53279)=3 THEN END
100 GOTO 90
1000 COLOR 2:REM GRID-ROUTINE
     ###
1005 FOR X=0 TO 190 STEP 5:
     PLOT 0,X:DRAWTO 79,X
1007 NEXT X
1010 FOR L=0 TO 78 STEP 6:PLOT
     40,80:DRAWTO L,191
1017 PLOT 40,80:DRAWTO L,0:
     NEXT L
1020 FOR RULES=9 TO 99 STEP 11:
     PLOT 40,80:DRAWTO
     0,191-RULES
1025 PLOT 40,80:DRAWTO
     0,RULES:PLOT 40,80:
     DRAWTO 79,RULES
1030 PLOT 40,80:DRAWTO
     79,191-RULES:NEXT RULES:
     RETURN
```

—Bobby Wilks

Abstract Art

For TRS-80 Model III or IV

The screen of your TRS-80 will fill up randomly with this program. If you change line 90 to GOTO 10, this random graphics function will repeat over and over until you break the loop.

```
5 REM ABSTRACT ART
10 CLS
20 V=RND(128)-1:W=RND(128)-1:
   X=RND(48)-1
30 Y=RND(48)-1:Z=RND(20)
40 FOR I=V TO X STEP Z
50 FOR J=X TO Y STEP Z
60 SET (I,J)
70 NEXT J:NEXT I
80 T=T + 1:IF T<100 THEN 20
90 GOTO 90
```

—John Conroy

Navaho Weaving

For TRS-80 Model III or IV

A broken-line pattern flows onto your screen from the top down, and then shadings slide in from the left to the right. Because of the endless loop in line 90, this program creates several different patterns, continuing until you break the loop.

```
5 REM NAVAHO WEAVING
10 CLS
20 FOR I=1 TO 127 STEP(RND (3))
30 FOR J=1 TO 47 STEP (RND (3))
40 SET (I,J)
50 NEXT J
60 NEXT I
70 FOR T=1 TO 600
80 NEXT T
90 GOTO 10
```

—John Conroy

Grid*Star

For Atari

This program, chock full of FOR/NEXT loops and counting functions, draws sets of diamonds with concave sides.

```
0 REM GRID*STAR
10 GRAPHICS 24:COLOR1:TRAP100
15 SETCOLOR 2,0,0:SETCOLOR 4,0,0:
   SETCOLOR 1,0,13
20 FOR X=0 TO 90 STEP 5
30 PLOT 160,X:DRAWTO 160+X,90:
   NEXT X
40 A=0:FOR X=250 TO 160 STEP
   -5
50 PLOT X,90:DRAWTO 160,90+A:
   A=A+5:NEXT X
60 A = 0:FOR X=180 TO 90 STEP
   -5
70 PLOT 160,X:DRAWTO 160-A, 90:
   A=A+5:NEXT X
80 A=0:FOR X=90 TO 0 STEP -5
90 PLOT 70+A, 90:DRAWTO 160,X:
   A=A+5:NEXT X
100  IF PEEK (53279)=6 THEN RUN
105 IF PEEK (53279)=3 THEN END
110 GOTO 100
```

—**Bobby Wilks**

Indian Art

For TI 99/4A

This program creates a pattern similar to North American Indian art.

```
5 REM INDIAN ART
10 CALL CLEAR
20 FOR T=1 TO 16
30 CALL COLOR (T,T,T)
40 NEXT T
50 CHR=40
60 FOR X=1 TO 24
70 CALL VCHAR (1,X,CHR,24)
80 CALL HCHAR (X,1,CHR,24)
90 CHR=CHR+4
100 NEXT X
110 GOTO 50
```

—**Paul A. Crocker**

Diagonal Draw

For VIC 20

For the unexpanded VIC 20, this program draws multicolored blocks that move diagonally across your screen from the upper right to the lower left.

```
5 REM DIAGONAL DRAW
10 PRINT CHR$(147)
20 A=7680
30 Y=A+30720
40 H=INT (RND (1) * 7)+1
50 POKE Y,H
60 A=A+20
70 POKE A+B, 102
80 IF A>8185 THEN A=A-507
90 GOTO 30
```

—**John Carter**

Oriental Carpet

For Apple II, II+, IIe

The rug pours onto the screen from the four corners. It has a symmetrical pattern with black, vertical and horizontal bars crossing in the middle. This program gives a green, blue and black rug, but you can change the colors by changing the numbers in the data statement.

```
10 REM:ORIENTAL CARPET
20 GR
30 DATA  0,12,2,2,2,2,2,2,2,2,2,2,2,
   12,0,-3
40 FOR K=0 TO 18
50 FOR U=0 TO K
60 READ H: IF H=-3 THEN
   RESTORE: READ H
70 COLOR=H
80 PLOT U,K,:PLOT 39-U, 39-K
90 PLOT 39-U,K:PLOT U, 39-K
100 PLOT K,U:PLOT 39-K, 39-U
110 PLOT 39-K,U:PLOT K,39-U
120 NEXT U
130 NEXT K
```

—**Loretta Holz**

Electric Canvas

For Apple II, II+, IIe and III (with emulation mode)

A simplified drawing program, this requires a joystick. But because it's so simple, it lacks some special features, and is somewhat hard to control. It's best at drawing random modern art.

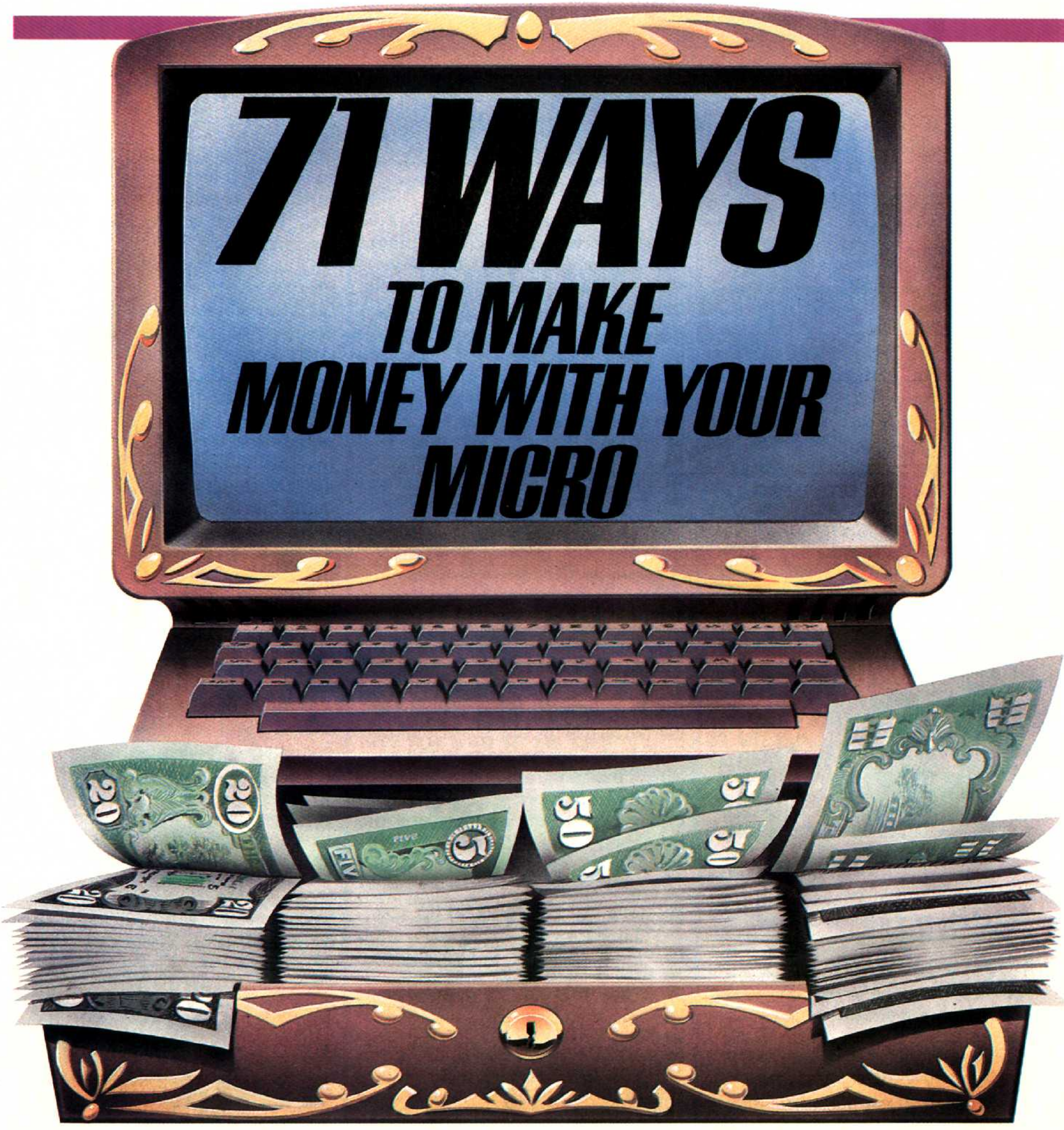
Once the program has been typed in and is running, you will see a blinking cursor that moves with your joystick. Exercise restraint—a slight nudge of your joystick will move the cursor pretty far. As you move the cursor, hold down BUTTON 1 on the joystick. Disjointed purple and green lines will follow the cursor wherever you move it. To draw a straight line, stop the cursor and let go of the button. Then move your cursor, without stopping, to the end of the line you want to draw, and push BUTTON 1.

To clear the screen, press BUTTON 0. To change the colors that you're drawing, change the HCOLOR commands and the HGR command.

It may take some practice to control the joystick, so don't get discouraged.

```
5 REM ELECTRIC CANVAS
10 D=1:HGR2
20 HCOLOR=3:X=C
30 Y=PDL (1)/1.6:X=PDL(0)/.913
40 A=PEEK(-16287):IF A>127
   THEN 170
50 M=PEEK(-16286):IF M>127
   THEN 160
60 IF X>C THEN X=X+1
70 IF Y>D THEN Y=Y+1
80 IF Y<D THEN Y=Y-1
90 IF X<C THEN X=X-1
100 IF X< 0 THEN X=0
110 IF X>279 THEN X=279
120 IF Y<0 THEN Y=0
130 IF Y>180 THEN Y=180
140 HPLOT X,Y:FOR P=1 TO 200:
    NEXT P
150 HCOLOR=0:HPLOT X,Y:
    GOTO 20
160 HGR2:GOTO 30
170 D=D+1:X1(D)=X:Y1(D)=Y
180 HPLOT X1(D), Y1(D):IF D=2
    THEN 200
190 FOR R=1 TO 150:NEXT R:
    GOTO 20
200 HPLOT X1(1), Y1(1) TO X1(2),
    Y1(2):CLEAR:GOTO 20
```

—**Shahzad Chowdry**



71 WAYS TO MAKE MONEY WITH YOUR MICRO

BY LORETTA HOLZ

If you know about computers, you can cash in on that knowledge in a number of ways. How many different ways? Well, there must be hundreds. But we decided to see just how many we could define. So we sat down and figured out 71 specific different ways to make money with your micro or as a result of your interest in—and your knowledge of—microcomputers.

Some projects demand more knowledge than others. Some require you to have some kind of equipment. For others, you don't need any hardware, just your computer know-how.

Read down the list and locate the projects best suited to your age and knowledge, as well as your hardware and software. Narrow down the possibilities and then pick the money-making methods best for you. One of the great things about micros is they are not only fun, you can also make money with them!

1 Ask your local computer store to recommend you to people who have just bought a computer. You can help them to set it up and get it running.

2 Contact local clubs like the Elks, Jaycees, etc., and offer to maintain their mailing lists and print labels whenever they need them.

3 Help your mother and father set up a family budget and enter information into it. You'll not only help them see where they could save money; you might also get some of those savings to buy more computer equipment!

4 Bring your computer along (if it's not too large) when you babysit, and teach the kids to use it. You'll be a very-much-in-demand babysitter.

5 Use your computer as a word processor and make up playbills for local drama groups.

6 Print personalized calendars for local businesses to hand out to their customers. You can make up an original with computer designs, and a printing company can make copies.

7 Demonstrate how a computer works, and what it can do, to women's clubs, PTAs, senior citizens and other groups.

8 Ask local computer stores to recommend you as a programmer when people need a special program that can't be bought off the shelf.

9 Get a program which plays BINGO and run a party for fun and profit. Charge a small amount for each game and give prizes.

10 Show a local real estate office how the salespeople could keep track of homes for sale by using a database. Help them to set up their own database using an off-the-shelf program.

11 Gather small groups of students in your home and teach them how to program in Logo, BASIC or Pascal.

12 Find or write a seasonal program (for example, one that plays Christmas carols and has Christmas graphics on the screen) and set it up to run on a computer at a local store. Alternate the seasonal program with a message from the store manager.

13 Rent your computer equipment to a small businessman who is considering buying a system but would like to try one first. Give some instruction as part of the deal.

14 Get a check-writing program and help your parents keep track of the checks they write. They might save money by avoiding penalties for being overdrawn, and they certainly can save time when making out their income tax.

15 Help a hardware store to get started using a program to keep track of the shop's inventory.

16 Run a second-hand book exchange, buying and selling all kinds of books. Keep track of your books, as well as your profits, by using your computer. You could print up lists of books you have for sale and give them out to customers.

17 Use a word processing program to write articles about computers or other subjects for local newspapers.

18 Help your mother keep track of her supermarket coupons by using your computer. Help her figure out what to buy and which coupons to use to save the most money.

19 Ask your local YMCA or YWCA, boys' or girls' club or neighborhood center to hire you to teach a course on Logo, BASIC or computer literacy.

20 If your local pet shop buys pet food in large quantities and puts it in smaller packages or bags for sale, ask if you could have the job of printing the labels for the packages using your computer.

21 Talk to the teachers in your school and see if you could write a program they need or if they would like you to enter data or make up tests with a word processing program.

22 Obtain or write a program that evaluates which investment plan pays the most money. Offer your investment evaluation service to your parents and others for a fee.

23 Put an ad in the newspaper and offer to tutor younger kids in math and reading using your computer. Help them to learn by using off-the-shelf programs or ones you write for them to use.

24 Learn about programs appropriate for a law office and call on local lawyers. Offer your services to help the office manager select the hardware and software and get started using a computer.

25 Do you have a typing tutor program? If so, rent time on your computer so people can learn to type.

26 Obtain or write a program that makes computer-printed banners, and set up your computer at a craft show. Your customers can ask for names, or any message, printed out in large letters.

27 For a local heating contractor, write a program that compares the cost of heating homes in your area with various fuels. Company salespeople could use this as a selling tool.

28 For a large department store, write a program for a computer that would be located near the entrance. Customers could type in the items they were looking for and the computer could tell them on what floor, and in what department and aisle, to find these items.

MAKE MONEY WITH YOUR MICRO

29 Obtain or write a horoscope program, and take a booth in a flea market. Type in the customer's birth date and have the computer print out his or her horoscope for the day.

30 Start working in a computer store. If you are old enough, you might get a job as a salesclerk. If not, see if you can't do odd jobs as needed. A computer store is an excellent source of contacts for paying projects.

31 Write a program that tells a short story for a child's birthday in such a way that you can put in a child's name and information about him or her. Make customized printouts as birthday cards and sell them to parents, grandparents and others so they can send them to the children as birthday cards.

32 Use a database program to record information about your family's possessions, including the name of the item, date purchased, cost, and identifying number. This database will be invaluable if your belongings are lost as a result of fire or theft, etc. Offer to provide the same service for other families.

33 Check with bowling leagues in your area. Some might like you to use your computer to keep track of players' and teams' scores and averages.

34 Keep the programs you own in a "lending library" and let people borrow them for a certain period of time for a fee.

35 Run your own job placement office. Advertise to potential customers who might need garden work, babysitting and other jobs done. Keep track of your workers and the jobs with your computer and send out computerized bills monthly for your services.

36 Write a game program and sell it to one of the game software companies. Competition in this field is very tough.

37 Contact a local nursery school and see if the director would like you to show small groups of younger kids how your computer works and let them experiment with it in small groups.

38 Many independent businesses do jobs for people and then have trouble collecting their money. You could help a plumber, or electrician, etc., collect his money by preparing his billing letters each month using a word processing program.

39 Have you purchased programs to help you prepare for the SAT exams? If so, rent out time on your computer to fellow students who would like to use the same programs.

40 Set up a fortune teller's booth at a farmer's market, or flea market. Instead of reading palms or looking into a glass ball, program your computer to answer customers' questions (use the random function) and predict the future! Let customers take home a printed copy of their fortune.

41 Do you have a paper route or know someone who has one? Write a program to keep track of the customers' names, addresses, the papers they get, and how much they owe.

42 If you have a word processing program for your computer—and a printer, sell time on your machine to students who need to write papers.

43 If you have a local restaurant that changes its menu often, provide it updated menus using your word processing program. The restaurant could have plastic folders into which your printed menus would slip.

44 Harried mothers are often willing to hire teenagers to help with birthday parties. Run a computer birthday party with a computer demonstration, a chance for each child to try a game and take-home, personalized printouts for each child made as the children watch.

45 Local businesses, private schools and organizations of all types need press releases to send to newspapers and radio stations. Prepare such releases and easily make up special versions as needed.

46 Lots of people want to learn about computers. You could teach computing classes at computer stores, community adult schools and other locations.

47 If you don't feel you could teach a class by yourself, you could be an assistant computer teacher. You could help with computer classes.

48 If you have written an original program, or found a new way to do something with your computer, sell your work to a computer magazine—there are now over 100 of them!

49 What sports teams are active in your area? Could you write a program to keep track of team standings, batting averages, home runs, and other statistics? You and your computer might become the record keeper for the team(s).

50 Do you know any coin, stamp, or baseball card collectors? Or people who have other collections? Write a program, or find a database program, that would help the person keep track of his or her collection and its total worth.

51 Teachers want to learn about computers, especially when their schools first get them. Give lessons to one or several teachers in your local grammar school.

52 People want to know what's happening with computers in their area. Why not start your own local computer newsletter? Local computer stores would probably buy ad space and computer owners would buy subscriptions.

53 Selling used computer equipment could be a profitable business. Keep a list on your computer of people who want to buy items and those who want to sell. Match them up and ask a percentage of the selling price for your efforts.

54 Have you done something interesting with your computer? If so, write to the editor of a magazine that covers your kind of computer and tell about your project. The editor may want you to write an article about your work.

55 Help your parents save money on bills for their automobiles. Write a program that figures out how many miles per gallon the car is getting and keep track of the information. When the mpg goes down, see if it is time for a tune-up.

56 Print Christmas cards with designs made from characters on the keyboard. Make personalized cards for customers to send.

57 Using a word processing program, type your mother's favorite recipes and those of other good cooks (perhaps members of a club she belongs to). Sell copies of the cookbook you put together from these recipes.

58 If you have to study for final exams or other big tests, program your computer to give you review lessons. Sell time on your computer to other students who would want to use the same drill you prepared.

59 Write a program to keep track of all your money-making activities as well as school work and other important things you should not forget. Plan your time carefully because time is money.

60 Pick out the newest and best game software you have and write a review of it. Tell what you like about it and what is not so good. Submit your review to a local newspaper or one of the computer magazines you read.

61 Get a program that figures out biorhythms. Set up a booth at a school fair or flea market and make up personalized biorhythm charts for customers.

62 Insurance agents, accountants, and other business people in your area may have invested in computer equipment but they may be having problems using it. Send out a flyer to businesses, selling your services as a problem solver and adviser.

63 Your computer can be a poet, if you program it correctly. Give it lots of data statements and have it choose among these using a random statement. Sell the poetry it generates! You could personalize it and print it neatly.

64 Write an article about computers and submit it to a children's magazine. Tell how a computer works or about programs that can be run on a computer.

65 Buy a program that makes up word search or crossword puzzles. Make up puzzles and sell them to a local newspaper.

66 Find a club that needs a newsletter and prepare it with your computer using a word processing program.

67 Learn about the various spreadsheet programs and what they can do. Practice using one of the leading programs and then tell local business people about your skill. Line up jobs teaching how to use it.

68 Did you just add a new piece of hardware to your system? Did you have problems doing it? How well is it working? A magazine about your particular type of computer might pay you for a review of your new hardware.

69 Write a program to calculate how much money you are making. Keep track of how much has come from each source, how much you owe and how much is in the bank. Sell the program to clubs or organizations that could use a simplified bookkeeping system.

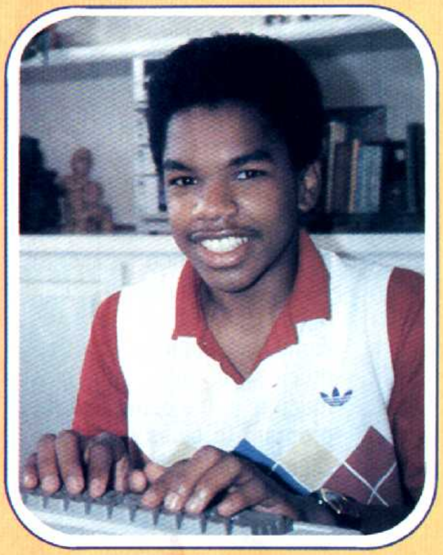
70 Ask your parents, relatives, neighbors and people in local businesses how you and your computer might help them? They may come up with some money-making ideas for you.

71 Write a brief description of an original way you have made money using your computer and send it to **Microkids.** If we use it, we'll pay you $25. ■

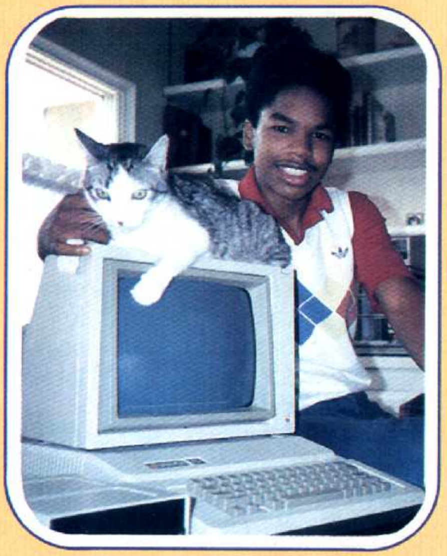
THE WHIZ KID

WHO REALLY IS A WHIZ KID

BY DAVID S. FREEMAN



Jeffrey Jacquet, who stars as Jeremy on the TV series "The Whiz Kids," is a real-life whiz.



Working on his Apple IIe, Jeffrey is creating a quest/adventure game for a game company.

There is a phrase: *art imitates life . . .* or is it *life imitates art?*

In the case of Jeffrey Jacquet, it would take a computer to figure it out.

Jeffrey, at 17, stars as Jeremy Saldino in the CBS series "The Whiz Kids", and is a whiz kid in real life.

The show, as all RAM raiders, byte bingers and haphazard hackers know, is about a group of high school kids who use their computer, affectionately known as "Ralf", to solve crimes.

"It's a hot topic," declares Jeffrey.

The series has drawn flack for seeming to condone breaking into other computers even though the kids are usually punished and their purposes are to help and protect innocent people.

Jeremy the Whiz Kid and Jeffrey the actor have a lot in common, beginning with their mutual interest in computers. Years back, already a video game hotshot, Jeffrey started sneaking time on his father's computer to see if he could invent his own animated-graphic games. Jeffrey's father responded with a fitting punishment—buying Jeffrey his own Apple IIe, this ensuring his addiction.

Jeffrey and his "Whiz Kids" co-stars (clockwise): Todd Porter, Matthew Laborteaux, Melanie Gaffin and Andrea Elson.

Soon after, Jeffrey met Greg Segall, president of Mind Games Inc. and The Software Consortium, companies which have designed and marketed such computer games as Desecration, Secret Agent, and Alpine Encounters. Now Jeffrey is writing a new computer game for Mind Games.

The game involves a quest, with the seeker responding to clues and choices encountered as he or she goes along. The text is completely finished, and Jeffrey is now experimenting with different kinds of graphics to accompany the seeker's journey. The result, he hopes, will be double-density excitement.

In "The Whiz Kids," Jeremy is an earnest and hardworking student. Jeff also is a whiz at school, tearing through most of the advanced courses his high school has to offer. He's fluent in Spanish, and has taken every advanced science and math class he could, including several that will give him college credits. He has spent a summer doing DNA research in a lab at the University of California in San Diego. Though in high school, he's managed simultaneously to be enrolled in several college courses from the University of California at Berkeley, a school he may attend next year.

Right now his Berkeley classes include English Literature, Calculus and Psychology, all of which he manages on top of a busy shooting schedule for "The Whiz Kids."

"Although I love science, math and business," states Jeffrey, "I'm currently fascinated by my psychology course. It's amazing to stop looking at people's surface, and start looking at *why* they're doing what they're doing."

Jeffrey's business experience goes back to a time even before computers. A few years ago Jeffrey wanted a motorcycle, but his father wouldn't let him have one. So, Jeffrey went out and bought a used one from a friend, and hid it in his closet.

"I tossed clothes and other stuff on top if it," explains Jeffrey. "Since my closet is my private disaster area, my parents never thought to dig under the rubbish to hunt for a motorcycle."

He proceeded to rent it to friends on weekends, and thus earned back more money than he paid for it. He was finally caught by his father and forced to sell the motorcycle, which he did for three times its original price.

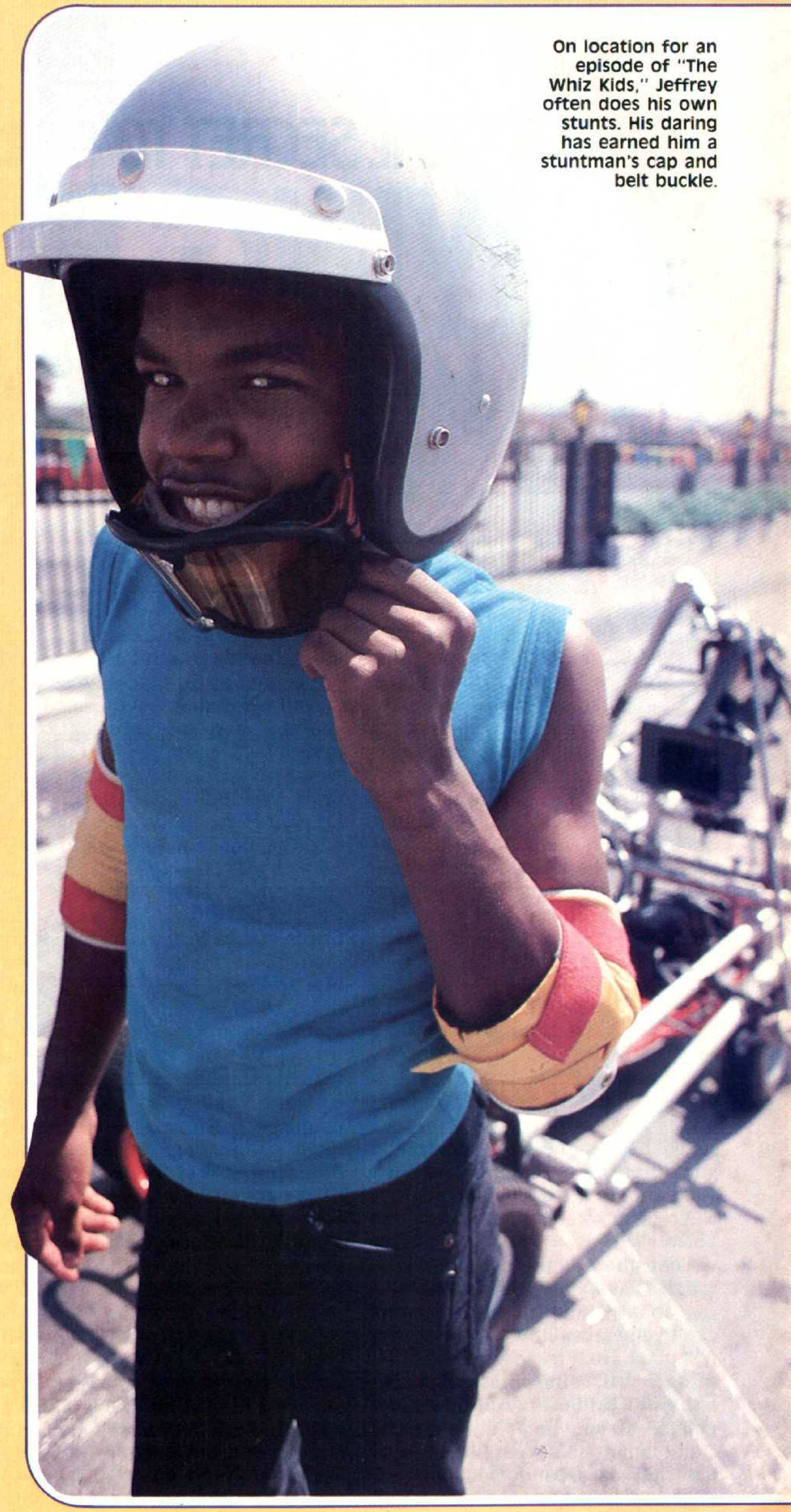
In the TV show, Jeremy is the most physical of the kids. He's highly athletic, and often has to deal with challenging situations.

So does Jeffrey in real life. He refuses to let a stuntman do any of his parts. As a result, he does such stunts as jackknifing over a car, jumping on top of a flatbed truck with a vicious dog ready to attack, and doing harrowing chase scenes.

"I'm no stranger around the studio hospital. I think I've set a record for minor scrapes and injuries," confesses Jeffrey.

The stunt coordinator for the show was so impressed he first presented Jeffrey with a stuntman's cap. Then he gave him a stuntman's belt buckle. The cap and buckle show progressive ranks among stuntmen, the way different color belts do in karate.

Jeffrey started to act almost as soon as he could talk. At age four he landed his first commercial. Since then he has appeared in more than 200 national commercials including the famous 7-Up spot with basketball superstar Magic Johnson. He has appeared in several movies, including the Walt Disney film, *Return To Witch Mountain* and he has appeared in several other TV shows, including "Mork And Mindy." ■



On location for an episode of "The Whiz Kids," Jeffrey often does his own stunts. His daring has earned him a stuntman's cap and belt buckle.

THE REAL SECRET TO BUYING A COMPUTER

BY RICHARD H. EYSTER

There's a secret to buying a computer—it's not bits, or RAM, or even brand names. The real secret to buying a computer is finding the right computer store. Once you've chosen the right store, choosing the right computer is a snap. If you trust your computer dealer—if you and he get along—then even the most difficult problems can be straightened out.

There are all sorts of computer dealers.

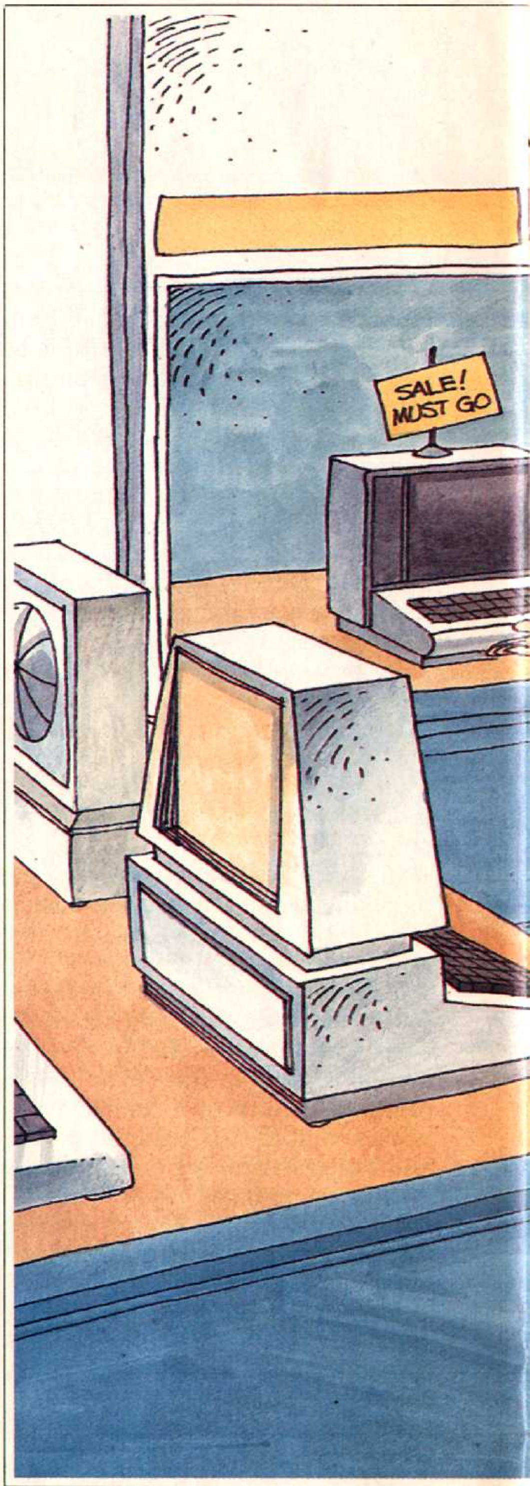
There is the fellow who was selling pet supplies last week. His mother-in-law told him computers were hot, so he dropped everything to open his own store. He doesn't know all that much about computers, but that doesn't stop him from giving advice to anyone who will listen, because he's not planning to stay in business that long anyhow. Next month he'll be into another line . . . maybe selling Snoopy robots.

Then there is the computer hermit. He has spent so much time talking about (and to) computers he can't remember how to talk to the rest of us. He'll try to explain something to you, using phrases like *concurrent CP/M-86* and *run-time diagnostics*. If you don't quite understand what he's mumbling about the first or second time around, he'll say he's got to check something in the back. Then he'll start talking to his computer again. And not come out till you're gone.

And who can forget the laughing, smiling, slap-'em-on-the-back Mr. JoyBoy? "I promise you—it will work, no problem!" he says, as he urges you to buy an Atari joystick for your PCjr. "Why, we've just run out!" he moans about a product he's never had. "Of course it's the right connection," he swears, as he hurries you out the door with an Apple printer cable for your Commodore modem. As you leave you can hear him on the phone. "We've got hundreds of them, and the best prices around—you just come on in!"

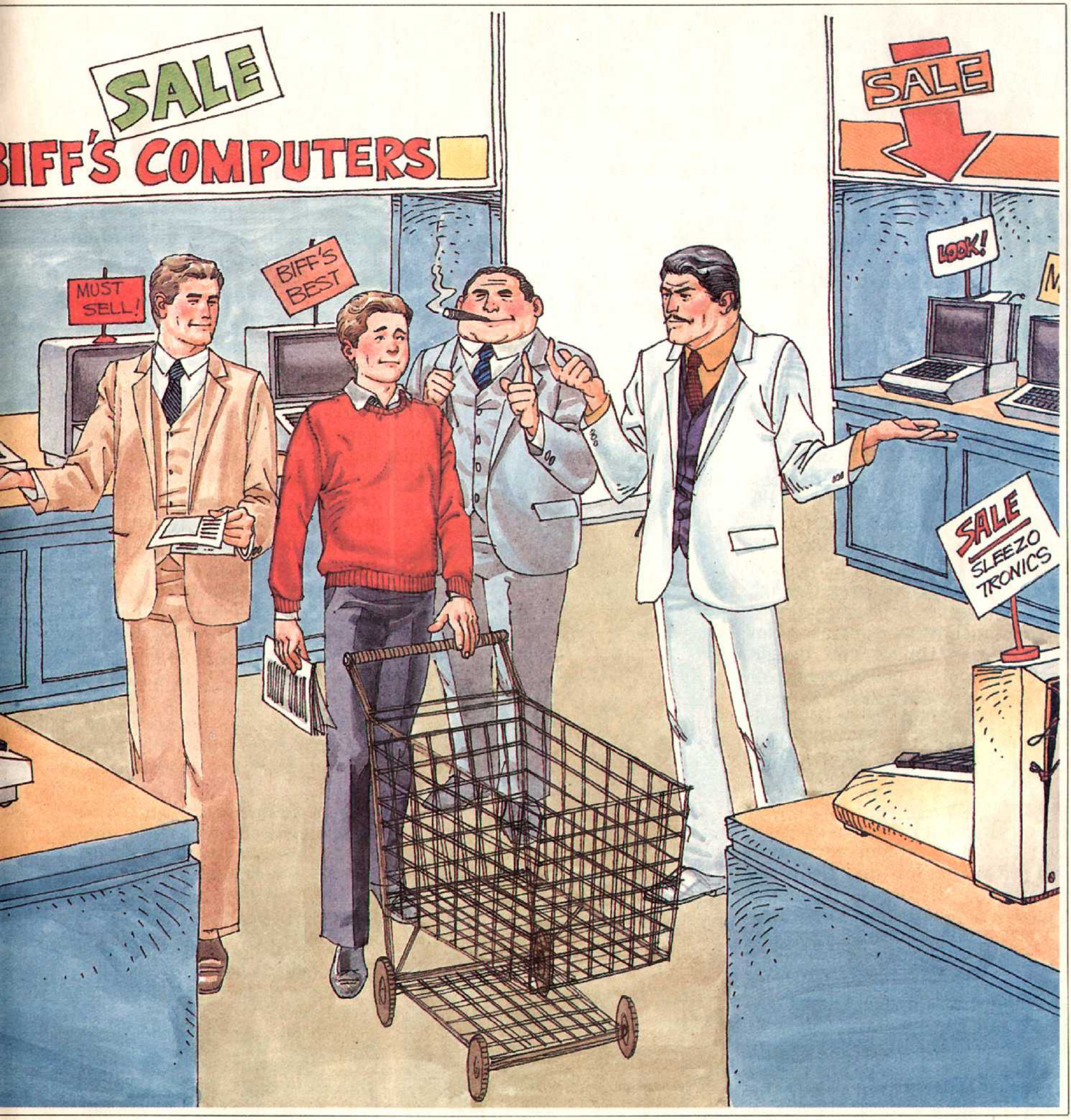
Finally, there is the special dealer who likes and understands computers—and likes and understands people, too. He wishes everybody liked computers. He wishes you did. And it may even be that he likes computers a little too much. Whenever some kid is trying out a game in his store, the dealer's fingers twitch—*he* wants to be at the controls! This dealer is probably just the fellow for you.

In the coming years, you will probably spend a great deal of time and money on your computer system. One of the best things you can do for it—and for yourself and your family—is to find a store where the dealer is honest and really knows what he's talking about.



There isn't any sure-fire recipe for finding the right dealer. But there are certain things you can do—both at home and at the store—to increase your chances of finding the right one for you. There are five specific steps you should take before you leave home.

1. Know what you're looking for. Do some reading and talk to friends about the equipment you're interested in. Dealers don't have time to teach you what you should have



taught yourself. But if you come into the store already knowing something about the equipment you're after, they'll be much more willing to help add to your knowledge. And you'll be able to tell just how much they know.

2. Find out which dealers carry the equipment you're looking for. Most computer dealers specialize in several brands. Save yourself time and trouble by checking the Yellow Pages or calling in advance.

3. Find out which stores have good reputations. Ask around. In the process you also may find out where *not* to shop!

4. Find out the prices of the equipment or software you're looking for. Know how much you should spend (and can afford) before you leave home.

5. Take a parent along. Even if you know a hundred times more than your parents do, drag at least one of them along. You've probably had the experience already—store owners pay a lot more attention to adults.

Once you are prepared, there are then several questions you can ask yourself in the store.

What does the store feel like when you step through the door? Is it a cheerful place? Do the customers seem rushed? Do the clerks really like computers?

How are kids treated? Are there kids playing video games and sampling joysticks, or is this mostly a grownups' store?

Are customers allowed to try things out? Do you see customers playing games, or using the software? Do the sample computers look like they're there to be tried, or just to look pretty?

What brands of micros does the store specialize in? Most stores carry several different brands, but most also play favorites. Try to find a store that has your choice of computer displayed—preferably front and center.

How much of the software is really for kids? Some computer stores specialize in business computers and software, while other seem to aim at families and kids. The easiest way to tell is by browsing through the software.

How much of the software is for your micro? Unless you bought your computer in Portugal, or you've got a seven-year-old antique, you should be able to find a good selection of software for it. If not, this probably isn't the store for you.

Look at the prices: How do these compare with what you expected to pay? You should almost always be able to buy computer equipment and software at less than list price. Everybody discounts—the only question is *how much*?

How fair does the dealer seem? Particularly if you are considering a major purchase, try to deal directly with the store's owner. Clerks will come and go, but the owner will still be there when you've run into trouble seven months later. How would he react? Would he be helpful? If something didn't work, does he seem like the kind of person who would be fair about taking care of it, or would he let you suffer? This is the hardest, and probably the most important question you'll have to answer.

Finally, how much does the dealer really know about microcomputers? Almost any dealer can give you a flashy sales spiel. The question is: is he just a salesman, or does he also know computers?

In conclusion, these are some tips you should know.

- Learn the dealer's name. Whenever you phone or drop by, call him by name. Remind him that you know him, and that he ought to know you.
- When you're first speaking with the dealer, if someone recommended him, tell him. You may get friendlier service—everybody likes a compliment.
- Some dealers will offer free pirated software with a new computer. (You can usually tell it's pirated because the disk label is hand-written and the instructions are photocopied.) Although this is appealing, it could mean the fellow is a little shady. You could gain in the short run, but lose in the long run.

NEW
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- Although it seems hard to believe, more and more computer stores are going out of business. Just before they close up shop, some dealers go on discounting sprees, selling everything at great discounts. The only catch is that you have to pay today, and they'll have your system ready for you next Monday. But when you go to pick it up Monday, the door is locked, and there's an OUT OF BUSINESS banner slapped across the window. Don't pay for something until you actually get it.
- Be careful of mail order. Mail order houses advertise in the back of computer magazines. They have great prices. They ought to. They don't have stores. They don't have clerks. In some cases, they don't even have any equipment. But the biggest problem with mail order companies isn't that a few are crooked. It's simply that the guy who sold you the equipment isn't going to be there to help you if you have a problem.
- Give your sales receipts to your parents. They may be able to take some of the cost of the computer equipment off on their taxes. ■

Seven Questions

There are seven questions you can ask a computer dealer. The questions have no specific right answers. But noting the answer will give you excellent insight into what treatment you can expect from a computer store.

1. What happens if the equipment I buy doesn't work the moment I get it home? Some stores offer instant replacement.
2. What happens if the equipment I buy breaks down while it's still under warranty?
3. What happens if the equipment I buy breaks down after the warranty has expired?
4. Does anyone from the store ever make house calls in a pinch?
5. Does the store do its own servicing, or does it ship the machine to another location?
6. Will the store let you test equipment and try out software before you buy it?
7. What is the store's policy on software that doesn't work when you get it home?

This article has been taken from the book, Random House Computer Catalog For Kids, which will appear in bookstores around the country in the autumn of 1984.

DYNAMIC DUO

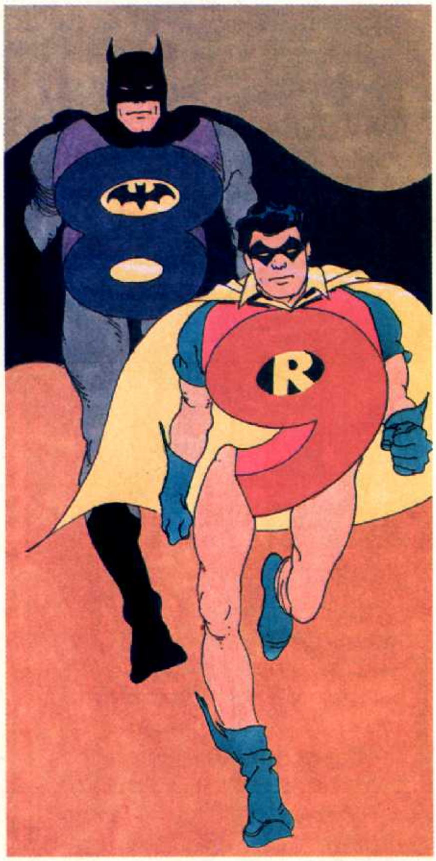
A PROGRAM YOU CAN COPY

This guessing game takes more than guessing to figure out. The computer picks two numbers, adds and multiplies them and gives both answers. You have to think the process backwards to find the two numbers.

This program uses only the numbers from 1 to 9. If you want a more challenging game, you can make it include higher numbers. Do this by changing the random statements in lines 50 and 60. If you have a younger brother or sister who would like to play the game, you could make it easier by including fewer numbers. Again, change the random statement.

The program is written for the Apple. The changes you have to make for other computers are listed below. In running this game, the computer picks the two numbers through two random statements. Notice the various ways these personal computers get random numbers in BASIC.

```
10 HOME
20 VTAB 5: PRINT "THE COMPUTER
   WILL PICK TWO NUMBERS"
30 VTAB 7: PRINT "THEN ADD AND
   MULTIPLY THEM."
40 VTAB 9: PRINT "YOU WILL
   GUESS THE FIRST TWO
   NUMBERS.":PRINT
50 LET A=INT (RND (1) * 9) + 1
60 LET B=INT (RND (1) * 9) + 1
70 LET A$="ADDED THEY EQUAL: "
80 LET B$="MULTIPLIED THEY
   EQUAL: "
90 PRINT : PRINT A$;A+B
100 PRINT B$;A * B
110 PRINT "TYPE THE NUMBERS
    WITH A COMMA BETWEEN."
120 INPUT X,Y
130 PRINT
140 IF A=X THEN GOTO 170.
150 IF A=Y THEN GOTO 170.
```



```
160 PRINT "SORRY TRY AGAIN.":
    GOTO 70
170 IF B=Y THEN PRINT
    "CONGRATULATIONS! YOU GOT
    IT.": GOTO 210
180 IF B=X THEN PRINT
    "CONGRATULATIONS! YOU GOT
    IT.": GOTO 210
190 PRINT
200 PRINT "SORRY, TRY AGAIN.":
    GOTO 110
210 PRINT : PRINT "DO YOU WISH
    TO DO ANOTHER (Y/N)"
220 INPUT F$
230 IF F$ = "Y" THEN GOTO 50
240 PRINT "HOPE YOU ENJOYED
    THIS GAME."
```

CONVERSIONS

Atari

```
5 DIM A$(20):DIM B$(24):DIM F$(20)
10 CHR$ (125)
20 POSITION 1,5: PRINT "THE
   COMPUTER WILL PICK TWO
   NUMBERS"
30 POSITION 1,7: PRINT "THEN ADD
   AND MULTIPLY THEM."
40 POSITION 1,9: PRINT "YOU WILL
   GUESS THE FIRST TWO
   NUMBERS.": PRINT
```

Commodore 64

```
10 PRINT CHR$ (147)
20 PRINT:PRINT:PRINT "THE
   COMPUTER WILL PICK TWO
   NUMBERS"
30 PRINT: PRINT "THEN ADD AND
   MULTIPLY THEM."
40 PRINT: PRINT "YOU WILL GUESS
   THE FIRST TWO NUMBERS.":
   PRINT
```

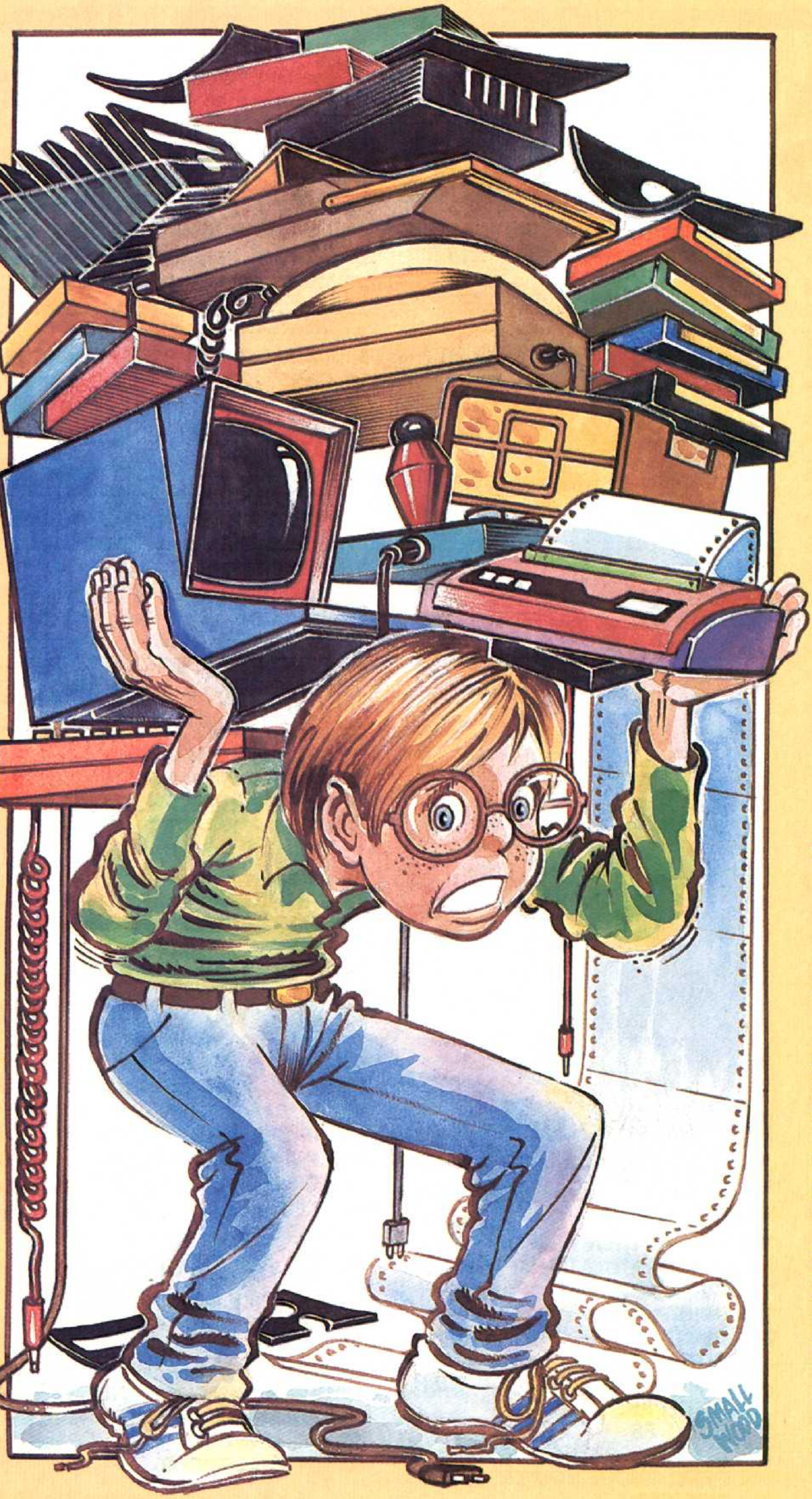
TI 99/4A

```
10 CALL CLEAR
20 PRINT "THE COMPUTER WILL
   PICK TWO NUMBERS"
30 PRINT "THEN ADD AND
   MULTIPLY THEM."
40 PRINT "YOU WILL GUESS THE
   FIRST TWO NUMBERS."
50 LET A = INT (9 * RND)
60 LET B = INT (9 * RND)
170 IF B = Y THEN GOTO 210
180 IF B = X THEN GOTO 210
210 PRINT "YOU GOT IT. DO YOU
    WISH TO DO ANOTHER (Y/N)"
```

TRS-80

```
10 CLS
20 PRINT @ 256, "THE COMPUTER
   WILL PICK TWO NUMBERS"
30 PRINT @ 384, "THEN ADD AND
   MULTIPLY THEM."
40 PRINT @ 512, PRINT "YOU WILL
   GUESS THE FIRST TWO
   NUMBERS.": PRINT
50 LET A = RND (9)
60 LET B = RND (9)
```

—Loretta Holz



SETTING UP FOR WORD

Would you like a way to get your essays, reports, term papers and letters done faster, better and neater? Then you can use your computer as a word processor.

You may think of the computer as a machine that is good at handling numbers. And it is. But it is also great for working with words. To set up your computer as an efficient word processor, you need the appropriate hardware and a good word processing program.

HARDWARE

Good computer hardware can make word processing a breeze. In addition to your computer, keyboard and monitor, you also need a printer and some form of mass storage—maybe a cassette recorder, but better yet, a disk drive.

If you already own a computer,

PROCESSING

BY LORETTA HOLZ

the first step to take is to find out if it is practical for word processing . . . and if so, what additional hardware you need. When you type your text, whether it's a term paper, letter or whatever, it is stored in the random access memory (RAM). And either all or part of the word processing program you are using is also stored there.

If you will be typing very short reports and brief letters you may not need to worry about how much RAM your computer has. But if you want to do longer reports and term papers, you will find it very inconvenient to use a computer with limited RAM. Computers like the Commodore 64 and Apple IIe have 64K of memory, and this is usually enough for serious word processing. It's possible to get by with less than this.

When you decide to use your computer for word processing, suddenly the keyboard becomes very important. You are no longer hitting keys now and then as with games or programs. Instead, you will be typing, and a comfortable keyboard is important.

Some keyboards have function keys which can be helpful in word processing. These keys are assigned the special jobs. If your keyboard does not have function keys, then you will have to push several keys in conjunction to do a certain job (perhaps Control and one or more letters).

Since you will be looking at the screen so much, it is important that your monitor gives a sharp, clear image so the text is easy to read. A monochrome monitor is probably clearer than a color monitor of the same size in this function. If you are using a TV as a monitor, when you try using it for word processing, you may find the image is not clear enough.

An important question to ask about any monitor is how many characters—that is letters, numbers and symbols—can be clearly shown on the screen by your word-processing program. A black-and-white TV set can be used handily as a monitor if you have 40 characters across the screen. But color sets are of only marginal use with 40 characters. If you are producing 80 characters across the screen, on a black-and-white TV they will be fuzzy and hard to read. And on a color TV they will probably be impossible to read. To see that many characters clearly you would have to use a monochrome monitor TV with a direct video input.

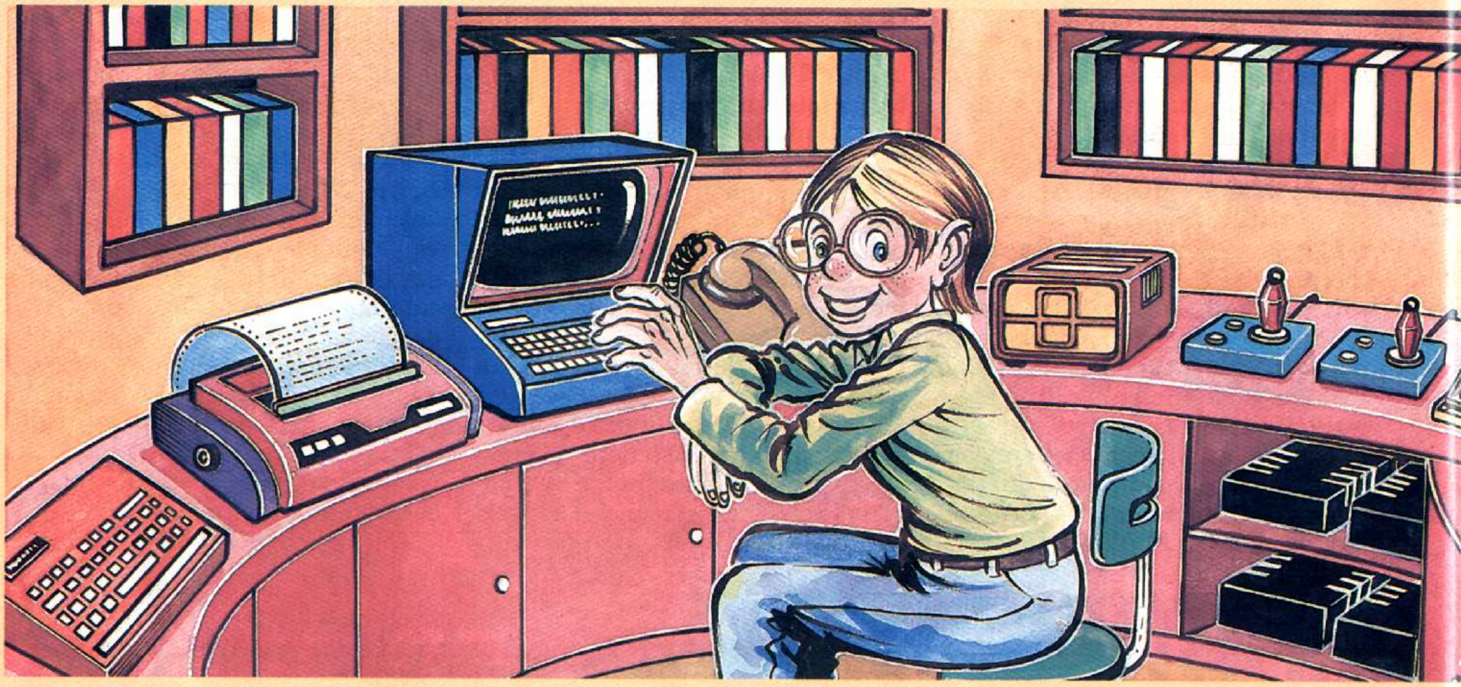
The design of the video section of the computer limits the number of characters which the screen will show horizontally and vertically. And this number can be important if you want to see how the text will be arranged on each line when it is printed.

Inexpensive computers have the video drive as part of the basic computer and are limited in the number of characters they can put on the screen. You may be able to add expansion cards to increase the character-handling ability. The more expensive computers usually can be expanded. For example, the Apple II+ which normally displays 40 columns can be expanded to 80 columns by inserting an 80-column card into the motherboard of the computer.

Since 65 is the number of characters you probably type across an ordinary business letter, you may want to be able to see this number across the monitor. But if you have only a 40-column display you won't. If you purchase an 80-column card or other addition for your computer, 65 characters and a border on each side can appear across the screen. If seeing your text just as it will be printed is not important to you, then you need not spend the extra money for hardware and software that allows a display of 80-character width.

The more of your text you can see on the screen the easier it is to do word processing because, for example, you may want to reread the beginning of a paragraph when you are typing the end of it. As a standard against which to judge, a good monitor combined with a good software package and a good computer should give you on the screen at least 24 lines with 80 characters in each line.

The quality of your printer determines how your finished work looks. The two popular types of printers are dot matrix and daisy wheel. The dot matrix, which is less expensive, prints characters formed by dots. The daisy wheel printer uses a wheel with the characters around the outside edge. When the text is printed with a daisy wheel printer it looks as though it were done with a typewriter. It is "letter quality" and you will have to decide if you need this enough to invest the extra money.



Generally, if you're only writing letters to family or friends, or taking notes, you can go with inexpensive dot matrix printers. But if you expect to do school papers, articles or business letters, you need a daisy wheel or a high-quality dot matrix printer.

Most printers can be used with various computers, but it depends. Professional level computers can be used with just about any printer. The more expensive printers are more versatile and can be adapted to different computers because they usually have one of two standard interfaces (RS-232 serial or Centronics parallel) and can be used with all but the least expensive computers.

Getting a printer for a less expensive computer is more of a problem. The Atari, for example, must have a special adapter to be used with a non-Atari printer. For the Adam computer system, the printer is part of the system and another printer cannot be used. And, the Adam printer cannot be used with another computer.

Software also affects printer choice, so if you want to use a certain word processing program, make sure you are buying a printer that will work with it.

Read about printers in a magazine devoted to your computer. When you have made your selection, you may find that you need an interface board to connect your computer to a printer. The salespeople at the store where you purchased your printer should advise you on the necessary equipment.

A floppy disk drive is a must for serious word processing. You can get by with a cassette recorder if you do word processing only occasionally and if you have lots of patience. Using a cassette is extremely slow and can be very frustrating. When you stop working you have to first save the file on the cassette. This is time consuming and very inconvenient.

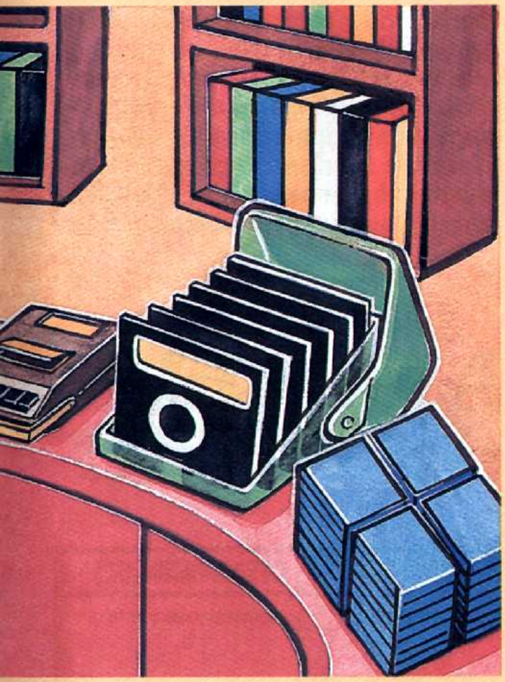
Floppy disks allow you to store files and load them very quickly into your computer for additions, corrections and printing. Many who do word processing prefer to have *two* disk drives rather than one. They put the program disk in one drive and the data disk in the other. While it is usually possible to use one disk drive, it is not convenient, for example, when you want to make a back-up copy of your data disk.

SOFTWARE

The software you use for word processing is the most important part of your word processing system. If you don't have a word processing program for your computer, you must be careful to find one which will run on your computer system with the specific hardware you have. The best word processing program for you is the one that does what you need to do and the one that you are comfortable using.

If you already have access—through your parents, perhaps—to a complicated word processing program such as WordStar, you can learn to use it nicely to do your reports, etc. In order to use a powerful word processing program, you do not need to know all that it can do. You need to know only enough commands to do your work.

If you will be buying a word processing program, find one that is less complicated and less expensive, but that works efficiently. To select such a program, you need to know what questions to ask and



what features to look for. Even if you already have a program, it's valuable to know what features can be found in word processing programs, so you can see how your program compares with others and whether you should think of buying a different one. In addition to learning what features to ask about, try to find a review of the program you are thinking of buying. Don't buy a Mercedes when all you need is a moped.

Choosing the best word processing program from the many good ones available is a challenge because hundreds of programs are being sold and new ones are constantly being introduced. They vary in price from about $30 to over a thousand.

You will find that some word processing programs are easy to use and some are easy to *learn* to use. If you will be using the program just off and on, you want one that is easy to learn, because you may forget it. On the other hand, if you will use the program often, you want to get the one that is easy to use. You may have to work with it for a while to learn what it can do, but once you know, the doing will be easy.

Some programs have menus on the screen which show you the commands you need to use. Some have help menus so you can look up procedures and come back to the text. If the menus are clear, they can be very helpful when you first start using a program.

The most important question to ask about any program you are thinking of buying is whether it will run on your computer. Some programs have versions to run on several machines but many have been written for one brand only.

Another important question to ask about a program is how much space it takes in the RAM and therefore how much will be left for your text. Some programs are completely loaded into the RAM and leave little room for text. Other programs avoid such problems by storing parts of the text on disk and bringing it back into RAM as needed.

Word processing programs allow you to store text in files. Some ask you for a name for each file before you begin typing text. Others allow you to type text and give a name for the file just before you store it, which is handier.

When you are considering a program, check the procedure for saving text. It should be foolproof. That is, it should make it difficult for you to make a mistake. Some programs will only save what is before the cursor so that if you forget to put it at the end, you lose text. This is not a good procedure.

With most programs, entering information is easy. You type on the keyboard, and the letters appear on the monitor. The programs usually have word wrap, which means that you never need to hit the return button until you come to the end of the paragraph. When you fill a line, the next word is automatically put on the next line. Your program may also have right justification. That is, each line ends in the same column. The computer automatically figures out how many spaces to put between words (called microspacing) and puts them there.

Working with a word processing program is more relaxing than working with a typewriter because you know if you make a mistake with a typewriter you have to white out or erase the error. Since this is annoying, you become tense, not wanting to make a mistake. With a word processing program when you make a mistake, you can usually just back up and type the word again. Some simple word processing programs let you delete only one character at a time and this can be tedious. Others allow you to delete a word at a time and some allow you to delete either a line of text or a sentence. Check procedures for deleting when you are considering a program, and be sure they are simple and convenient.

The best thing about using a word processor is that once you have typed in your text, you don't have to type it again. You can store it and load it back into the RAM. When you test a program don't just type in text, but see how easy or difficult it is to change what has been written. A convenient way to make changes is important.

Look for a program with easy cursor control. The cursor, which indicates your position on the screen, might be a rectangle or an underline, and it may be solid or blinking. What is important about the cursor is that you can find it easily on the screen. Also important is how easily the cursor can be moved to the place you want to make the correction.

You may be able to move the distance of a character, word, or line at a time. You may be able to move to the next sentence or paragraph, to the beginning or end of a line, to the top or bottom of the screen, or to the beginning or end of the text. In expensive programs you have commands to do each of these, but while they are handy, you can still use the program without knowing every one of them.

Most programs allow you to search through your text looking for a specific word, and if you wish, you can replace it once or as many times as it appears in the text. Most allow you to move sentences and words. Check that the program you are considering does this and also how *easily* it does it. You will mark the beginning of a block and the end of it and then move, copy or delete it. The process may take just three keystrokes, but it may take quite a few more. The fewer it takes, the easier it will be for you to learn the process.

When you are testing a program, print some text to see how the program does it. The best programs will print what you see on the screen. With less expensive programs, you see the text one way on the screen (perhaps in 40 columns) but it prints out wider.

Some programs give you the choice of printing two different versions, one which is meant to be easy to revise and another which is meant to be a final version. You can correct your work by looking at it on

FACE-OFF...

PROGRAM	MANUFACTURER	COMPUTER	COST	ADVANTAGES	DISADVANTAGES
ADAM	Coleco	Runs on: Adam (Built into system)	Included	Easy to use. Versatile system. Nice choice of text display.	Computer breaks down.
APPLE WRITER IIe	Apple Computer, Inc.	Runs on: Apple IIe (Disk)	$150	Highly recommended by Apple. Can be quite sophisticated.	Requires 80-column card for serious work. Difficult to use.
ATARI WRITER	Atari	Runs on: Atari (Cartridge)	$100	Good value for the price. Good manual. Menu-driven.	Needs disk and disk drive for storage of material.
BANK STREET WRITER	Broderbund Software	Runs on: Apple, Atari, Commodore 64 (Disk)	$70	Very appealing introductory word processor. Used in elementary schools. Extremely easy commands.	Editing takes a lot of time on the menu.
CIRCASCRIPT	Circidian Software	Runs on: Commodore 64, Apple II, II+, IIe (Disk)	$40	Inexpensive. Single keystroke needed for some commands.	Must edit by moving cursor one character at a time and changing modes.
COLOR SCRIPSIT	Radio Shack	Runs on: TRS-80 Color Computer (Cartridge)	$40	Good fundamental package. Simple-to-operate commands. Loads quickly.	Limited to simple home tasks. Reversed color capitals may be a nuisance. Limited memory.
CT-5	public domain	Runs for: Commodore 64	Free	One of a number of programs free from user groups. Good for kids or beginners.	Elementary level. Limited memory.
CUT AND PASTE	Electronic Arts	Runs on: Apple, Atari, Commodore 64, IBM PC (Disk)	$50	Good graphics. Simple program, suitable for small children. Very easy manual.	No search and replace features. Limited use beyond simple writing.
HESWRITER	Hes	Runs on: Commodore VIC 20 (Cartridge)	$60	Easy-to-use, simple program. Not menu driven. Can be expanded with other cartridges.	Limited memory.
HOME WORD	Sierra On-Line	Runs on: Apple, Atari, Commodore 64, IBM PC and PCjr (Disk)	$60	Nice use of graphics as menu prompts. Easy to use. Contains good variety of skills.	On-screen menu pictures cut space for word processing.
MAGIC WINDOW	Artsci	Runs on: Apple (Disk)	$150	Popular in schools. Easy to use. Good starter program for young children.	Half of every sentence is off the screen.
PAPER CLIP	Batteries Included	Runs on: Commodore 64 (Disk)	$100	Wide variety of functions and scope. Hard to begin, but worth the effort.	Requires special key. Manual is very poor. Can be difficult to use.

the screen, but you may find it more convenient to make a printed copy which you can correct at your leisure. You can read your work over several times, make pencil corrections, and later add these corrections to your stored text.

If you print out a copy of your text and decide you want it to look different, this should be easy to do. The program should allow you to format or prepare your text for printing. You should be able to choose single or double spacing, create larger or smaller margins and make other changes.

Are you a good speller? If not, you might purchase a spelling program which will check your text for spelling mistakes. The program should know a large number of words, but you will still have to teach it words not included. It will ask if a certain word it does not recognize is correct and if you say that it is, this word could be added to the list of words it accepts. ■

PROGRAMS ONE-ON-ONE

Here is a chart showing low-cost word processing programs, and on the following pages are some quick reviews of some of the programs. The chart shows that every system has advantages and disadvantages. Thus, it is important that you actually try a program if you can so you'll know whether you'll be comfortable with it. In addition to these, there are free word processing programs—called public domain programs—usually available through most user groups. They are programs people have written and given to others, and they can be entirely satisfactory. ■

PROGRAM	MANUFACTURER	COMPUTER	COST	ADVANTAGES	DISADVANTAGES
PERFECT WRITER	Perfect Software	Runs on: IBM PC and many CP/M machines (Disk)	$350	New version has estimated three-minute learning time.	Older version is difficult and time-consuming to learn.
PFS WRITE!	Software Publishing	Runs on: Apple, IBM PC (Disk)	$125	On-screen image of printed page. Easy to use.	IBM version uses 128K; Apple version needs a full 64K.
QUICK BROWN FOX	Quick Brown Fox	Runs on: Commodore 64 (Disk), VIC 20 (Cartridge)	$70	Good for the first-time user. Easy-to-understand instructions.	Basic limited use.
SCRIPTOR	computer magazines	Runs on: Atari (Cassette or disk)	Free	Check back issues or user clubs for copy. Very basic program.	Limited power and use.
SUPER SCRIPSIT	Radio Shack	Runs on: TRS-80 (Disk)	$200	Good manual and teaching program. Good variety of features.	Requires special programs to work with printers not made by Radio Shack.
TEXT WIZARD	Datasoft	Runs on: Atari (Disk)	$100	Lack of menu-driven menu means no delays. Nice moving of text.	Must print whole document and each copy separately.
TI WRITER	Texas Instruments	Runs on: TI 99/4A (Disk)	$160	Full set of functions. Part of TI's business software.	Texas Instruments is no longer involved in home computers.
VIC EDITITE	public domain	Runs on: Commodore VIC 20 (Cassette or disk)	Free	Available from local VIC 20 user groups. Easy to use and a good beginning.	Limited beyond basics.
WORD HANDLER II, Version 3.5	Silicon Valley Systems	Runs on: Apple (Disk)	$60	Simpler version of a more expensive Word Handler. Runs without 80-column card.	Commands take two strokes Some commands are unusual. Must move through document one page at a time.
WORD PRO 1	Professional Software Inc.	Runs on: Commodore VIC 20 (Cassette)	$35	Part of a series of Word Pro, increasing in price and complexity. Simple to use.	Limited memory.
WORD PRO 3 PLUS	Professional Software Inc.	Runs on: Commodore 64 (Disk)	$300	Can be a very easy program to operate. Manual is good.	No word wrap. Requires two keystrokes for functions. Not all special features will print with all printers.
WORDSTAR	MicroPro International	Runs on: Apple II, II+, IIe, IBM PC (Disk)	$495	Very powerful. Editing is easy.	Can be confusing to learn.
THE WRITE STUFF	Harper & Row	Runs on: Apple II+/IIe (Disk)	$100	Straightforward, one-letter commands. Easy to learn.	Less powerful and less flexible than some others. Capital letters are difficult on the II+.

SOFTWARE SCOREBOARD

HOW 13 PROGRAMS STACK UP

APPLE WRITER

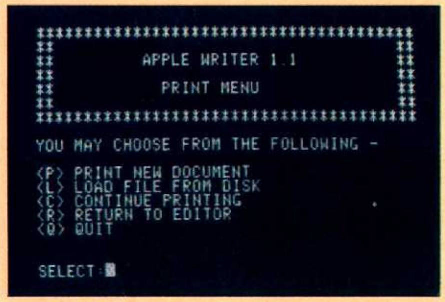
Apple Writer IIe, by Apple Computer, was designed specifically for use with the Apple IIe, and can be used with one disk drive, though two make it easier to use. One interesting feature of the program is its glossary, which allows you to equate a string of up to 128 characters with any upper or lower case letter, number or symbol on the keyboard.

The glossary, which is great if you use the same phrase over and over, can be saved in a file independent of the text file you are working on, so you can use it with other files. In this same glossary file you can store frequently used printer command sequences.

The program allows you to move small and large blocks of text by marking the beginning, end and the destination spot. The program also has a split screen feature that lets you see two widely separated areas of text at the same time for editing or comparison. You can also examine what is in a file on the disk without leaving the editor, and you can copy segments of that file into your program if you wish.

You do not see your text on the screen the way it will appear in print but instead you have to format it at print time. The margins and justification are easy to change if the text does not print as you wish.

The program comes with an attractive manual. The documentation, which was written for earlier versions of the program, has been recently rewritten. The manual has many illustrations and examples to show you what you can do with this software. The program could be used in an office but it is also used at home by many people who own a IIe.



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APPLE WRITER 1.1

PRINT MENU

YOU MAY CHOOSE FROM THE FOLLOWING -

<P> PRINT NEW DOCUMENT
<L> LOAD FILE FROM DISK
<C> CONTINUE PRINTING
<R> RETURN TO EDITOR
<Q> QUIT

SELECT:
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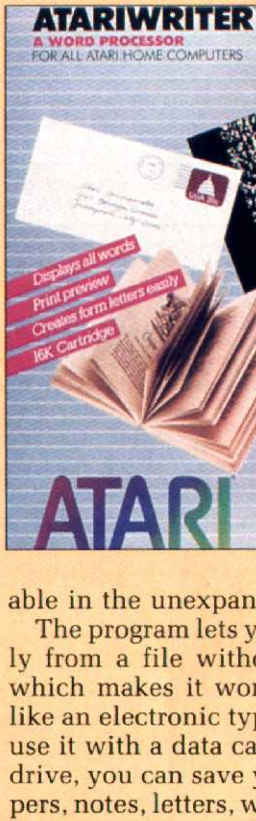
ATARI WRITER

Atari Writer, developed by Atari for all Atari machines, is what is best described as a "fast getaway, quick-study" kind of word processor. It has most of the formatting and text-handling capability that you need and demand from a word processor, with some special advantages.

First of all, it takes up absolutely no space in the Atari computer's memory, since it's a plug-in ROM cartridge. That means that all of the RAM is available for your files—whether it's 64K of RAM in the 800XL or just the 16K of RAM available in the unexpanded 600XL.



The program lets you print directly from a file without saving it—which makes it work pretty much like an electronic typewriter. If you use it with a data cassette or a disk drive, you can save your school papers, notes, letters, whatever for any future use. It's excellent for updating material, making revisions in a term paper, or whatever you want a word processor to do for you.

Atari Writer will run any of Atari's printers, including the new letter-quality machine. Making page layouts and formatting your changes is easier than on most home word processors that we've seen, and the status line on the top tells you exactly what the layout specifications are going to be. The 36-column x 20-line screen is just fine for working with regular TV sets as well as computer monitors. Atari Writer is best for home and hobby computing.

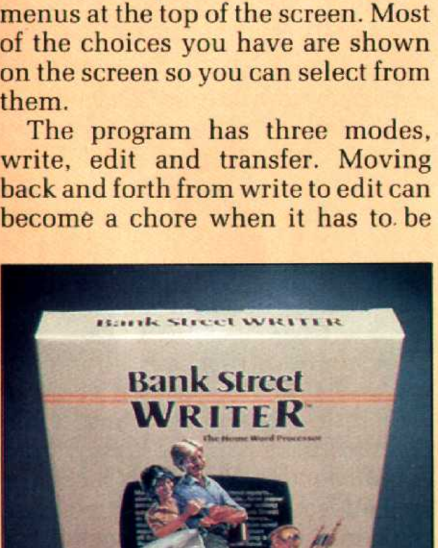
BANK STREET WRITER

Bank Street Writer, by Broderbund, was developed at the Bank Street College of Education in New York to be used primarily in classrooms, and it has become extremely popular for use at home. The program has been near the top of the popularity lists for months. It claims to be the first home-oriented word processing program and can be used by anyone.

The program is inexpensive compared to other word processing programs. It is simple, so anyone who has used other more powerful programs will find it to be limited to the basic needs of word processing.

It comes with a Quick Start card and the manual has an index/glossary to direct you to the information you need. While other programs require that you memorize a list of commands, this one has few commands, and places them in simple menus at the top of the screen. Most of the choices you have are shown on the screen so you can select from them.

The program has three modes, write, edit and transfer. Moving back and forth from write to edit can become a chore when it has to be done over and over. In the *write* mode you can enter text and back up to erase. But to do any other changing you have to go into the *edit* mode. If you make a mistake, at least you can unerase.



The program provides for two different types of printout, a rough draft and a final. It is especially good for brief reports. If longer ones are needed, the files can be linked. If you write many long papers, you will probably find this program inconvenient. It can't handle footnotes or merge files.

CIRCASCRIPT

Circascript, by Circadian Software, is an inexpensive word processing program for Commodore and Apple that may be for you. It was designed for beginners, but many people find it to be the only program they need. It provides the basic features needed in a word processing program . . . you can type in a few paragraphs, print them out with the program's preset printing instructions, and be happy that the program is so easy to use.

If you have problems using the program, they are likely to be related to using the editor. When writing, you have to move the cursor a character at a time down or across the screen. When you want to edit, you have to switch from the cursor movement mode to the editing mode. When the change is made you have to go back to the cursor mode. Going back and forth can be annoying.

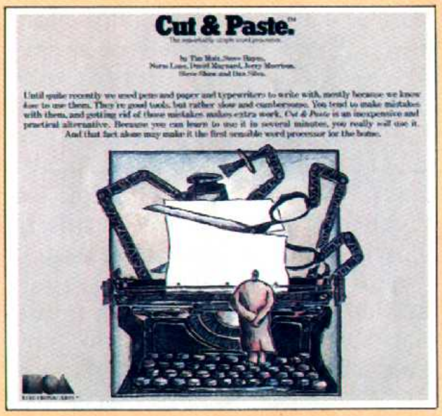
To set up your work for printing, you can embed control commands in your text and/or use a printer menu. The program allows you to center text, and to insert files from your disk anywhere into the text you are working on. You can view the list of files on the disk with a single keystroke.

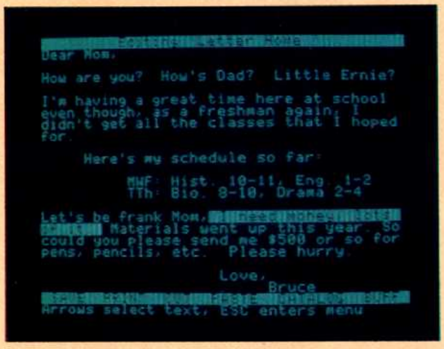
The program tells you the amount of memory still available with a single keystroke and warns you when the memory is nearly full. You can search for words and replace them. If you have a question, you can consult the help screens, which can be seen instantly with a keystroke.

CUT AND PASTE

Cut and Paste, on disk by top-ranked game-maker Electronic Arts, is an extraordinarily user-friendly word processor. You can get going without even looking at the abbreviated crib card, which you store along with the 12-page manual in a slot in the software's cardboard sleeve like a record in a cardboard record jacket.

The illustrations in the manual are arty, but not much help. But the manual is only 12 pages long so you can practically memorize it in one sitting. The crib card is page-number-indexed to the manual.





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Dear Mom,

How are you?  How's Dad?  Little Ernie?

I'm having a great time here at school
even though, as a freshman again, I
didn't get all the classes that I hoped
for.

     Here's my schedule so far:

          MWF: Hist. 10-11, Eng. 1-2
          TTh: Bio. 8-10, Drama 2-4

Let's be frank Mom, [illegible]
[illegible] Materials went up this year. So
could you please send me $500 or so for
pens, pencils, etc.  Please hurry.

                 Love,
                      Bruce
Arrows select text, ESC enters menu
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One neat feature of Cut and Paste is the bar on the screen top with a number on the right that tells you how much space is still left on your document disk. You always know how much room you have left without asking for the information or going through any complicated command sequences. The screen displays 80 columns x 22 lines.

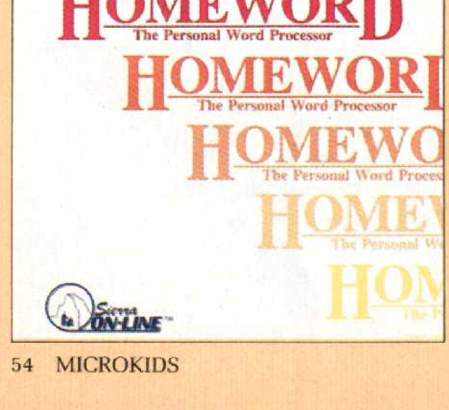
The actual cutting and pasting part of this processor is so easy, it's ridiculous. Control A (for "Anchor") sets your starting point and Control C cuts the section off with a firm snip of the scissors. Control P pastes it, naturally.

While this processor may not have the great depth of some of the high priced models, it's really a great package for use at home. And it's cheap.

HOME WORD

Sierra-On-Line calls **Home Word** a writing tool especially for the home. True, it's relatively unsophisticated, and therein lies its charm. It uses picture-icons along the bottom of the screen for menus, which makes it very user-friendly.

One drawback of Home Word is that it displays only 13 lines of text in 40 columns on the screen at a time. That's not an awful lot. But Home Word makes up for this by showing you a sketch of the page in the lower right corner. It looks like a free-hand drawing, but is a miniature of your page, showing you how many lines you have on the page, how long they are, and where they are. It's like a miniature picture of your final printed page—and the lines in the drawing fill up as you type along on the keyboard. There's just no other software that has a feature like this.



This word processor is so simple and easy to use, that it has become the main choice for non-typists and just about everyone who wants to use word processing for the first time and for light, home-type writing—school assignments, letters, shopping lists and reminder memos and some light, small business uses. Available on disk, it comes with a skinny, easy-to-understand instruction book and even has a cassette tape tutorial that walks and talks you through the setup and operations. Now how friendly can you get?

PERFECT WRITER

Perfect Writer is part of an integrated package that includes Perfect Speller, Perfect Calc and Perfect Filer. These are not programs that run on what we ordinarily think of as home or hobby computers. They are programs for business-oriented machines. But we mention Perfect Writer here on the theory that the program is a good one and if you have access to a business machine (such as from your mom or dad) this would be a word-processing program you would want to consider running on it.

The problem with any business-oriented word processor is that it takes time to learn. If you're like most of us, you want to get up and running right away. Perfect Writer comes with a tutorial on disk—a special program that walks you through the necessary steps and gives you a helping hand to make it easier to learn the program.

A new, improved version of Perfect Writer will be on the store shelves soon. This version 2.0 will be available for IBM-type computers first, and for the others later on. The new version has a lot of pull-down "windows" that bring help and menus onto the screen that you're using for your actual writing—making it a lot easier to learn. In fact, the software company says you can get up and running with this new version in three minutes.

You may use the original version, since a lot of these have been "bundled" as "free" software with many different computer systems. If you have access to a business-type computer, chances are you have access to Perfect Writer for it. Aw come on, it's not all that bad, and pretty soon you'll get so good you'll wonder what you were afraid of.

The program comes on disk, has a screen display of 80 columns x 24 lines and is best used in business and heavy-duty word processing.

PFS WRITE

PFS Write is one of those rare word processors that gives you an on-screen image of what the printed page will look like. Displaying 80 columns x 20 lines, the screen gives you a page outline with a ruler line along the bottom and a status line below that.

Aside from that, there's nothing cluttering the screen—just the stuff you type. This program is so easy to use, you can start off typing right away just going by intuition. If you need help, push two keys and get it instantly.

The manual has a step-by-step illustrated tutorial that teaches you all the ins and outs and how to use some of PFS Write's special features. You can also integrate it with other software—plugging in charts drawn by PFS Graph, using forms from PFS Report, etc. You can even insert VisiCalc spread sheets on the printed page.

Available on disk only for the Apple and IBM PC, the two versions are a little different from each other. On the IBM, you use those numbered function keys for a lot of the special features, and the screen display on the IBM is so gorgeous, it's mind-boggling. It actually underscores when that's what you want, instead of highlighting or showing special symbols.

The one problem is that the IBM version uses 128K, so if you don't have that, then you're out of luck. The Apple version needs a full 64K, but it isn't quite as pretty as IBM's screen. At $125, this program has to be one of the best dollar values on the market. It's best suited for moderate business and heavy home word processing.

QUICK BROWN FOX

Quick Brown Fox is the granddaddy of low-cost, quick-study word processors. Originally released as a plug-in ROM cartridge for the VIC-20, a Commodore 64 version followed, and now there are disk versions for the IBM PC and for CP/M-type business computers.

The manual is fairly easy to use, but you have to read the jacket notes carefully to discover a special command needed to get the VIC-20 to use the software. It's a simple line that you type under VIC BASIC's READY prompt, and then you're off and running with really cheap word processing.

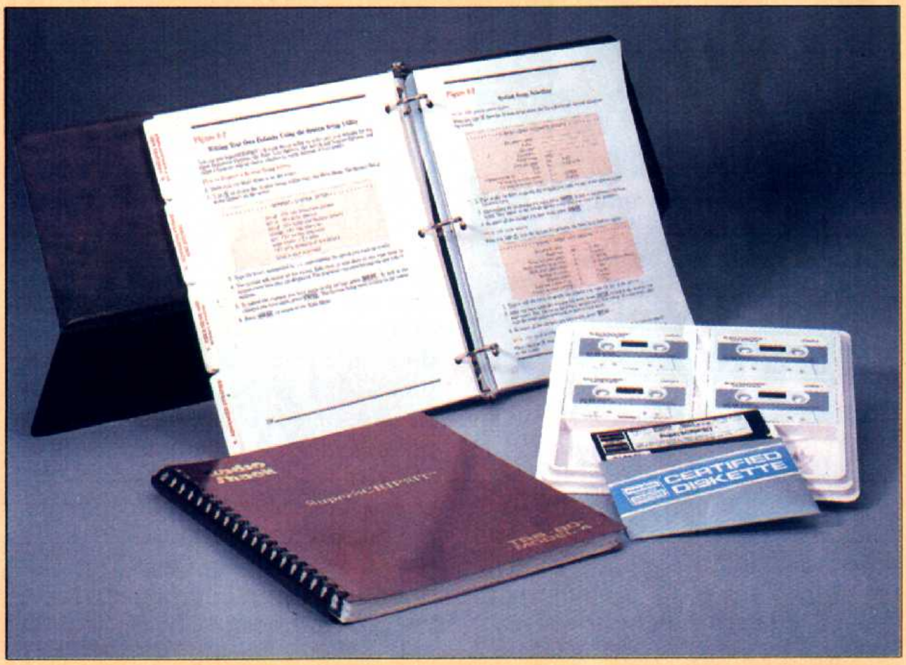
Q.B.F. will do many of the operations you ordinarily look for in the high-priced programs, and they're simple to call up. On the Commodore keyboard, a "#" command is all you need to get many of these.

The program is definitely not a what-you-see-is-what-you-get processor. Because it's designed to work with a variety of setups—unexpanded VIC and C-64 for example—you can get anywhere from 22 columns to 80 columns (if you have an 80-column circuit board somewhere in your hardware package). This means that the text all runs together and uses a lot of embedded commands. These are instructions that you type into the middle of a sentence or paragraph if you want it to do something special like changing the margin for a few lines, or boldfacing or underscoring or something like that.

The program displays 20 lines on the screen and is best used in home and hobby computing. It's definitely on the list of worthwhile low-cost word processors, and something for you to look at closely.

SUPERSCRIPSIT

SuperScripsit, for TRS-80 Model III's and 4's, is the successor to an earlier program called Scripsit. While (at $199) it costs twice as much as Scripsit, it can do more than twice the work. Many functions are common to both programs but only some of the commands are the same. Two versions of the program are available. The one for the Model III has an 80 x 24 character screen display while the one for the Model 4 has a 64 x 16 format.



The program has screens full of help menus which are most useful to the beginner. It does take a while to go through the process of consulting it. The program comes with audio self-training tapes and a reference manual.

The cursor is easy to move around with the arrows on the keyboard. By using the shift key plus the arrow you can move it to the beginning or end of the text. You can also move it backward and forward by the word, paragraph, video or printed page. The program has commands for finding, replacing and deleting, and these work both forward and backward in the text.

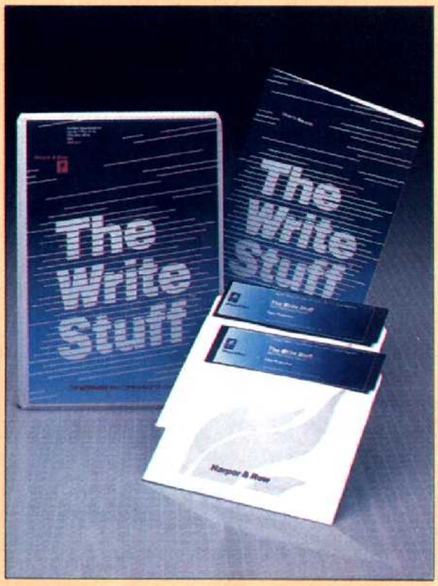
SuperScripsit has the ability to merge a list of addresses with a letter. Ten keys can be programmed so that each one will give a phrase or sentence up to 127 characters long when pressed. This lets you easily insert these phrases and sentences into your text.

The program helps to produce more attractive documents. It has proportional printing so the right margin can be straight, and it lets you know when you have come to a new page in the text. It also has underlining, boldface, super and subscripts. The added features of SuperScripsit seem more oriented to business rather than personal use but the program can be used for either.

THE WRITE STUFF

The Write Stuff, by Harper & Row, is called on its cover "The ultimate word processor for home and office." So its first appeal is to the home. It was written by the co-developers of the Bank Street Writer and it uses straightforward one letter commands. While it is not as powerful and flexible as other word processing programs, it is easy to learn to use. Directions are on the screen at all times.

The cursor can be moved a character, word, line, sentence or paragraph at a time. It can also be jumped to the beginning or end of the text. You can insert text at the cursor or delete letters to the right or left, and you can delete a word at a time.



The program can be used with an Apple II+ or IIe and a chart on the back of the manual shows the control keys for the commands for each machine. The IIe has upper and lower case letters so capitals are no problem. They are a problem with the II+ since it has no lower case letters of its own. You have to use a single slash before a letter to get a capital and two slashes to ask for the caps lock. This procedure could be very annoying (to say the least) to a touch typist.

TI WRITER

If you've got a TI-99/4A computer and you want to get a word processor for it, you'd better hurry. Texas Instruments stopped making their TI WRITER about the same time they stopped making the computer last year. There are still a few TI WRITERs around, but you'll really have to hunt them out. And when the store sells the last one, chances are they won't be able to get another.

Other word processors for the TI-99/4A include Direct Writer II and Textiger. These are written in Extended BASIC, and are from third-party supply houses—which means that they're not manufactured by Texas Instruments but by somebody else.

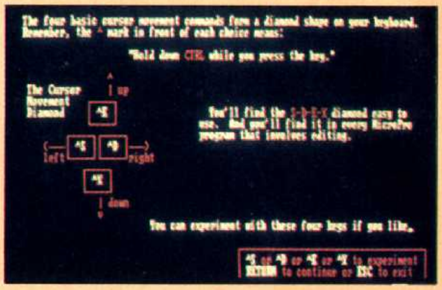
Whether or not these or some other lesser known word processing programs are still available for the TI computer is up to the usual channels of supply and whatever demand there is for them. Frankly, the TI computer's keyboard, for all of its full-stroke sculptured keys, isn't the world's greatest keyboard for word crafting, and it just never inspired a lot of different software houses to come up with word processing software.

WORDSTAR

WordStar is a very powerful (and famous) word processing program that has a long list of commands and does just about everything a word processing program is expected to do. Because it is so powerful, many people find it confusing at first. Once they learn how to use the program, most people really like it.

The program has help menus which you can consult. The most important commands are shown on the screen above the text, but the program has several help levels so that when you know the commands, you can get rid of this list and have the whole screen to work with.

While it takes time to learn the program, once you know how to use it, you can do almost anything you want. The program has been near


The four basic cursor movement commands form a diamond shape on your keyboard.
Remember, the ^ mark in front of each choice means:

"Hold down CTRL while you press the key."

The Cursor
Movement
Diamond
up
^E
left
^S
^D
right
^X
down

You'll find the S-D-E-X diamond easy to use. And you'll find it in every MicroPro program that involves editing.

You can experiment with these four keys if you like.

^S or ^D or ^E or ^X to experiment
RETURN to continue or ESC to exit

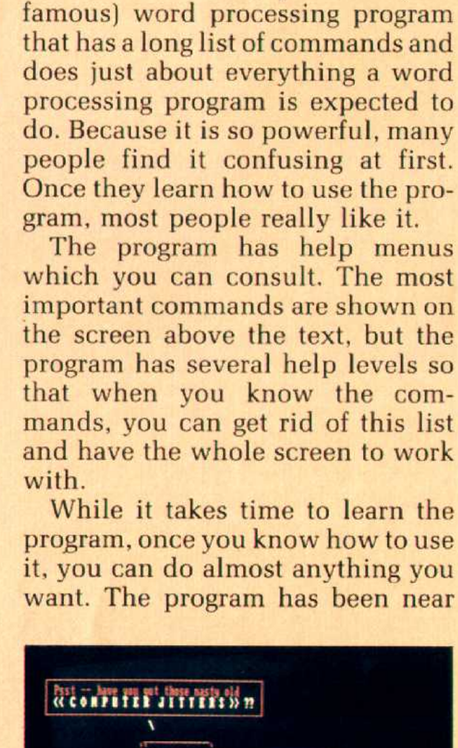
the top of the best-seller list for a long time, and makers of other programs compare theirs to WordStar because it has become the standard.

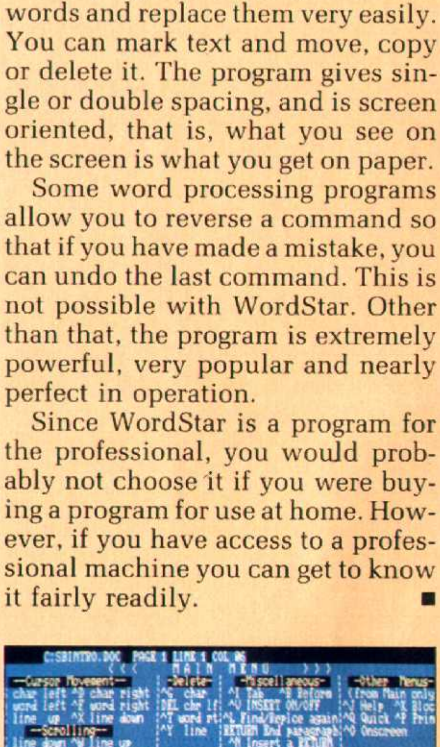
The program uses commands which you call for with the control key and one, two or even three letters. The text entry and editing are both constantly available so it is easy to stop, edit and then continue. The program has good cursor control so you can move forward or backward, a letter, word or line at a time.

The program allows you to find words and replace them very easily. You can mark text and move, copy or delete it. The program gives single or double spacing, and is screen oriented, that is, what you see on the screen is what you get on paper.

Some word processing programs allow you to reverse a command so that if you have made a mistake, you can undo the last command. This is not possible with WordStar. Other than that, the program is extremely powerful, very popular and nearly perfect in operation.

Since WordStar is a program for the professional, you would probably not choose it if you were buying a program for use at home. However, if you have access to a professional machine you can get to know it fairly readily. ■


Psst — have you got those nasty old
«COMPUTER JITTERS»?!
Do you wish that software
would speak clearly to you?
Will it EXPLODE if you press a key?
Press any key to find out!


```
     C:SBINTRO.DOC  PAGE 1 LINE 1 COL 06
                     < < <    M A I N   M E N U     > > >
 --Cursor Movement--     | -Delete- |  -Miscellaneous-   | -Other Menus-
 char left ^D char right |^G  char  | ^I Tab   ^B Reform | (from Main only
 word left ^F word right |DEL chr lf| ^V INSERT ON/OFF   |^J Help  ^K Bloc
 line  up  ^X line down  |^T word rt|^L Find/Replce again|^Q Quick ^P Prin
   --Scrolling--         |^Y  line  |RETURN End paragraph|^O Onscreen
 line down ^W line up    |          |  ^N Insert a RETURN |
 screen up ^R screen down|          |  ^U Stop a command  |
 ---!----!----!----!----!----!----!----!----!----!----!-----------------R

 STARBURST: The Builder's Book                           Introduction
 L

                            INTRODUCTION

rBurst gives you the power to fully automate your business procedures.  A
ical  business  procedure  involves  several  steps,  each  of  which  is
omplished by giving a command to your computer's operating system.  With
rBurst,  you  decide  what  the steps for each procedure  should  be  and
resent  all the steps as a single selection on a list,  or menu.  When a
cedure has to be performed,  all the computer operator needs to do is  to
lect a choice from a menu.
```

Fun and Games for Your Computer. A Quick Look at Some of the Most Popular Games.

GAME REVIEWS

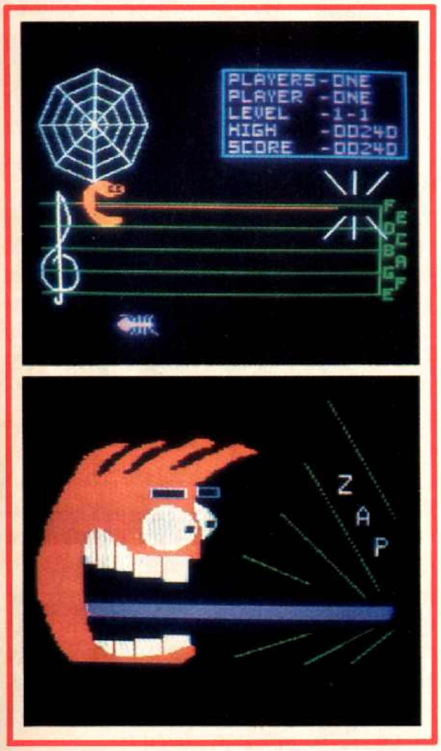
BY WALTER SALM

SPIDER EATER

For Apple with Koala Pad

Spider Eater, by Koala, is an overlay program for the Koala Touch Pad and the Apple, which lets your computer become both a mini-music synthesizer and a gameplay machine for teaching how to read music. But the learning part's only secondary. It's actually *fun* to use, so much so that you may have a problem keeping your mom and dad away from the Koala pad when this disk is in the drive.

A keyboard overlay for the touch pad becomes your musical instrument, and your spider eater sits at the clef (left) end of the music staff waiting for spiders to jump onto the lines from the bottom of the screen. You catch the spiders by pressing the key (note) that represents the line of the music staff that the spider has jumped to. If you're not fast enough, the spider will jump home to its web at the top of the screen.



There are four rounds of play and several levels of difficulty. After playing with this for a bit, you'll find yourself in competition with your friends to get the fastest action against the spiders. In the process, you're also learning music scales and how they look.

When you get tired of gobbling spiders, you can play some simple tunes on the keyboard, but it only has a one-octave range, so it's a bit limited.

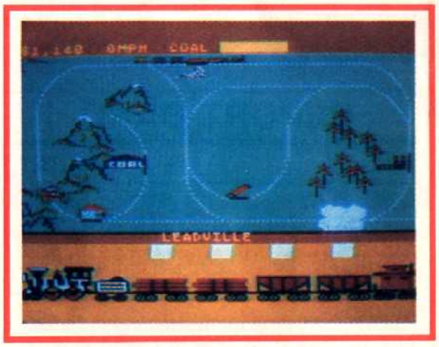
REPORT CARD	
TYPE	MUSIC-GAME-SYNTHEZ.
GAME PLAY	B
ORIGINALITY	A
GRAPHICS	A
SOUND	B
AGE LEVEL	8 and up
DIFFICULTY LEVEL	Med.
OVERALL RATING	B+

TRAINS

For Atari, Apple, Commodore 64 and IBM PC

Trains, by Spinnaker, is the computer-user's version of the electric train set, but with goals and level changes to make it challenging, as well as a lot of fun. Yes, it's very, very reminiscent of playing with electric trains on the living room floor.

The disk opens with some really funky electronically created music that sounds something like the chuffing steam trains of a bygone era. On the screen appears a bell-stacked 1870's vintage locomotive pulling a four-car freight train plus caboose. There are four kinds of cars: oil tanker, box car for farm produce, flat car for raw lumber, and a hopper car for ore.



The game has eight scenarios, and you can start anywhere you want to, but they get progressively harder, so it's a good idea to practice with level one first. In this one, the train consists of four oil tank cars, and at trackside are two oil wells complete with rocker-arm pumps and two refineries.

The object is to keep raw oil flowing smoothly from wellhead to refinery. Each pickup and delivery earns dollars (you start with $1,000 of capital). Watch your coal supply though. About every other circuit of the track, you have to stop at the coaling station and fill up. (It costs up to $500 to fill a nearly empty coal tender.)

The idea is to keep moving, to find the most efficient way to get raw goods to their markets, and keep supply levels up at the user points, while preventing surpluses at the raw-material sources. There can be work stoppages at the mill (if they run out of lumber) or the market (out of fresh produce) or the factory (out of ore), etc.

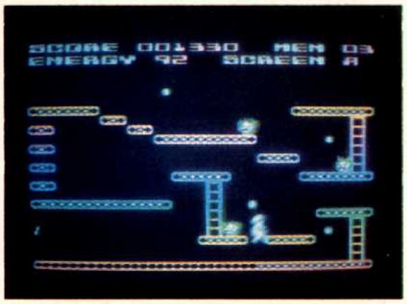
The game uses a joystick and the scenarios get more complex, through eight levels. Pressing the space bar on the computer calls up a status screen at the bottom of the track layout so you can see who has how much of what, and who needs more in a hurry. On-screen prompts let you know if someone's getting too low or if there's a work stoppage or something. This game's supposed to be educational. But it's great fun and a definite midnight-oil-burner.

REPORT CARD	
TYPE	STRATEGY
GAME PLAY	A
ORIGINALITY	A
GRAPHICS	A
SOUND	A
AGE LEVEL	12 and up
DIFFICULTY LEVEL	Med.
OVERALL RATING	A+

MR. ROBOT AND HIS ROBOT FACTORY

For Atari 800 and XLs

Mr. Robot And His Robot Factory, from Datamost, is a two-fold game: you can play the original game's 22 levels, or when you get to be an expert and bored with them, you can build your own Robot Factory from the construction tools that are included in the program. When you make your own, you save the new creations on a separate blank data disk that you have to supply.



You start with one robot and a factory that consists of conveyor belts, platforms and escalators that only go up. There are four alien fires on each level, and they can kill unless your robot is protected by a force field. Acquire force fields by touching energizer squares, then destroy the alien fires. At this point the game begins to resemble good old Pac-Man a little bit, but there are all those different levels with different patterns of platforms and such.

Like Pac-Man, you have some little "pills" to collect by walking on the platforms. There are bonus lives, poles to slide down, bombs to walk over and ignite, trampolines to bounce on, magnets to help your robot jump farther, and transporter tokens to move the robot through the air to other spots.

There's a countdown timer which calls itself "units of energy." But by any name, it's still a clock. If you finish the level before the time's up, you get to graduate to the next level. When the game is over you can enter your high score with the fire button on the joystick.

Because of the possibility of creating your own factory, this game has endless possibilities and can be really intriguing. There are two or three other games that let you do this, and they always seem to be the more interesting ones.

REPORT CARD	
TYPE	ACTION
GAME PLAY	B
ORIGINALITY	A
GRAPHICS	A
SOUND	A
AGE LEVEL	8 and up
DIFFICULTY LEVEL	Med.
OVERALL RATING	A–

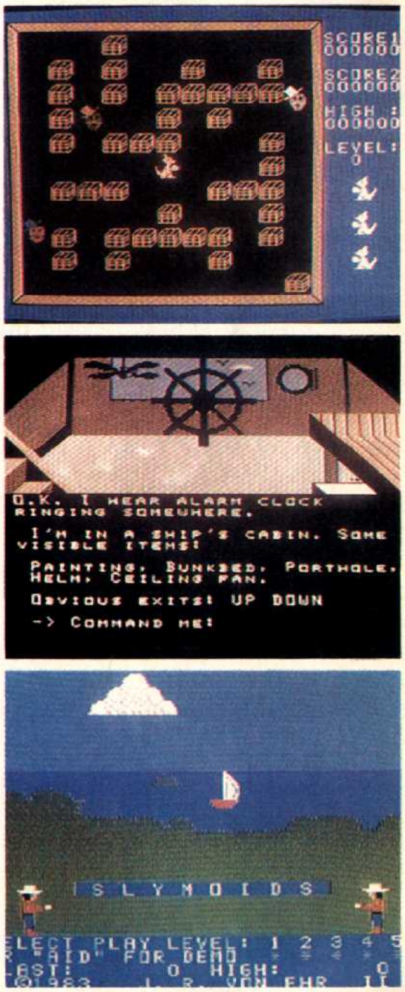
RETURN TO PIRATE'S ISLE, SLYMOIDS, HOPPER

For TI99/4A

Although Texas Instruments is no longer making TI 99/4A computers, the company continues to produce new games for that machine. Chief among the latest crop are **Slymoids, Hopper** and **Return to Pirate's Isle**.

Slymoids is a one-player game in which the player is a sharp-shooting cowboy who is America's last line of defense against an army of attacking Slymoids who come in two varieties—Jelloids and Spores. Joysticks are recommended.

In Hopper, a one or two-player game, Chadly the Kangaroo is trapped in the cargo hold of an ocean liner where three circus trainers—Rocko, Socko and Jocko—are attempting to capture him. Only quick thinking and lightning fast reflexes can save Chadley from the circus life. Again, joysticks are recommended.



O.K. I HEAR ALARM CLOCK RINGING SOMEWHERE.

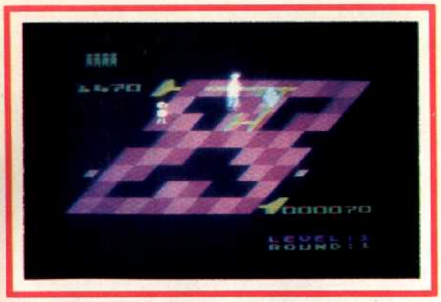
I'M IN A SHIP'S CABIN. SOME VISIBLE ITEMS:

PAINTING, BUNKBED, PORTHOLE, HELM, CEILING FAN.

OBVIOUS EXITS: UP DOWN

-> COMMAND ME:

In Return to Pirate's Isle, the player is plunged into a fantasy world where he must decipher a series of clues that will lead him to buried treasure. Along the way, though, he must first surmount mysterious pyramids and savage jungles. Like the others, this game is cartridge-based, but for best results use a disk or cassette storage device.



JUICE!

For Atari and Commodore 64

Juice, from Tronix, is surprising, interesting, original and superbly playable. This is strictly a one-player game that will keep you busy with the joystick well past curfew. And when you finally hang it up for the night, Mom and Dad will sneak in for a go at it!

You start with a tilted checkerboard-like screen that gives you a three-dimensional view something the same way that Zaxxon does. You have to build a circuit on the checkerboard by having Edison–your hero–jump onto each square of the board. In some ways, it reminds us of Q-bert, because you have to jump onto each square.

But watch out for the bad guys. They move down the board (from the top to the bottom of the screen), and one, the Killerwatt, grows legs and chases Edison. By some crafty maneuvering, you can get Killerwatt to fall off the edge of the board into oblivion. You play against the clock as well as your crafty enemies, and when you complete the circuit, electricity flows in eye-popping colors for a couple of seconds while your score is totaled, and you go on to the next screen.

There are six levels and high scores are saved on the game disk for future generations to gaze at with wonder and admiration. The game is really top-notch.

REPORT CARD

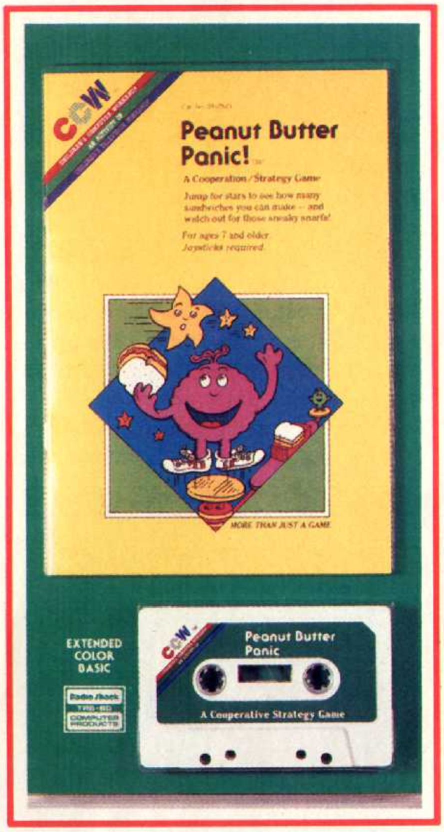
TYPE	STRATEGY/ACTION
GAME PLAY	A
ORIGINALITY	A
GRAPHICS	A
SOUND	A
AGE LEVEL	8 and up
DIFFICULTY LEVEL	Med.
OVERALL RATING	**A+**

PEANUT BUTTER PANIC!, TAXI, STAR TRAP

For TRS-80 Color Computer

Peanut Butter Panic!, **Taxi** and **Star Trap** are three new games on cassette recently developed by Tandy/Radio Shack as part of a "cooperation and strategy series." Designed for use on TRS-80 Color Computers with Extended BASIC, they all encourage players to work together toward a common goal. This is a new and interesting trend in computer games.

Peanut Butter Panic! is a two-player game where the two players have to cooperate to win. Each player jumps for stars to make peanut butter sandwiches, but they soon find that they must work together to get the most out of their leaps and thereby catch the most valuable stars.



In Taxi, each player is assigned a cab that he has to maneuver through a make-believe city, trying to deliver as many passengers as possible before his time is up. By working together, the various drivers can split their pick-ups to avoid long empty runs and so increase their scores dramatically.

Star Trap, for its part, is a dynamic maze game where cooperation really pays off. The challenge here is to trap a shooting star by blocking its path with Xs while maneuvering through special maze gates. One player can set a trap without too much difficulty, but two can do it much more quickly and thus advance faster to higher levels. ■

SUPER SEVEN

1. **Pac-Man**
2. **Demon Attack**
3. **Frogger**
4. **Zaxxon**
5. **Missile Command**
6. **Submarine Commander**
7. **Gorf**

WIN

A FREE SUBSCRIPTION TO **Microkids**

What makes a computer game a classic? We've picked seven of our all-time favorites. What are yours? Now you can vote in the **Microkids** Super Seven contest and help select the seven best computer games ever invented. The only limiting factor is that the game must have been written to run on at least one brand of microcomputer. To help things along, **Microkids** will give a free year's subscription to the first 25 persons to vote in the contest. You can vote by mail by sending your list to us at **Microkids**, June Super Seven, 133 Fifth Ave., New York, NY 10003. Or you can vote online by sending your list to us at our bulletin board address, The Source, Acct. No. BBK483, June Super Seven. In all cases we need your name, address and phone number.

The Way It Is At Computer Camp

While school bells ring in late June to mark the end of the school year for most students, 500 kids from five continents start packing (or thinking about packing) their bags for a school of a different sort. In fact, it's so different it's not called school. It's a cross between a summer school and a summer camp, and it's called the Champlain College Computer Camp.

The Computer Camp mixes the best of both worlds—a summer of sports and outings with campfires and ghost stories combined with an intensive exposure to computers. For two months each summer (in two- and four-week sessions) boys and girls ages 10 to 16 live in dorms and mix the thrill of CRT's and terminals in the mornings with summer sports in the afternoon.

What the school/camp staff calls "growth and development" and what the kids call *computing fun* comes in daily doses of four hours of computer time in air-conditioned classrooms every morning. Each classroom has one staff person for every five campers, and one computer for each camper. When the lunch bell rings there is no mad rush for the door.

Computin' kids enjoy four hours of classroom work each morning, then take the rest of the day for recreation or relaxing.

"Nobody's in a hurry to leave," says instructor David Baker. "They're all so glad to have uninterrupted time. It's unusual for any classroom to have one (computer) for each student."

In two weeks the kids get the equivalent computer training of a semester college course or a year in grade school. The curriculum serves beginners and advanced students and offers instruction in BASIC, FORTRAN, Pascal and Assembler. In addition, there are workshops in subjects such as word processing, telecommunications, computer graphics, etc.

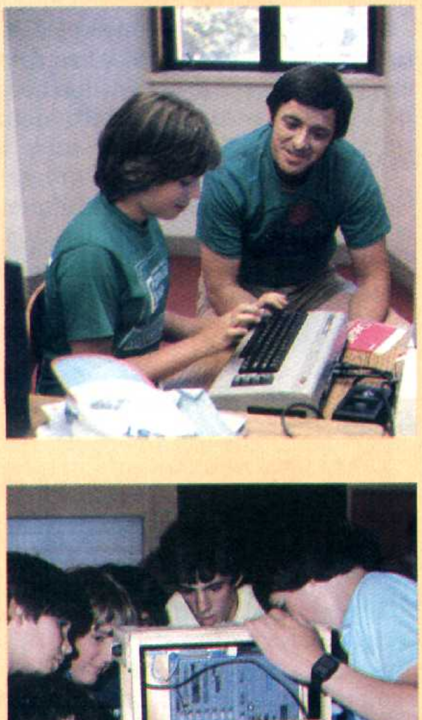
In the afternoons, the campers choose from more than 16 organized recreational activities: sailing, swimming, soccer, tennis, racquetball, photography, camping, biking, hiking, volleyball, canoeing, foot-

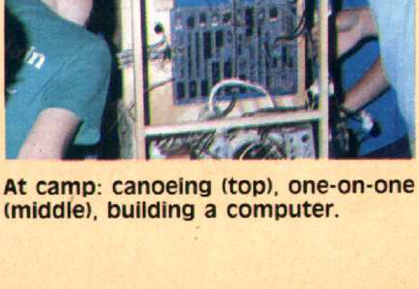
ball, crafts, theater arts, riding and softball. Most kids participate in at least two each day.

In the evenings there are sports, "humanities," and sometimes a full-camp activity such as a dance or talent show. And there are always the computers, and seminars concerning them such as telecommunications or how-to-build-your-own, etc.

But life's not all fun and games, and neither is computer camp. Campers must clean their own rooms, do their laundry, obey camp rules, learn to live in a group. It must not be too much of a drag, though. Representatives of the school/camp say that more than 50 percent of the campers return for a second (or third!) session at camp.

The computer camp is operated by Champlain College, a junior college in Burlington, VT, and the camp utilizes the dorms and facilities of the college. Enrollment for the camp is often filled by March, according to officials. A two-week session costs $825 and a four-week session costs $1,600. The camp takes approximately 150 campers in each session. ■

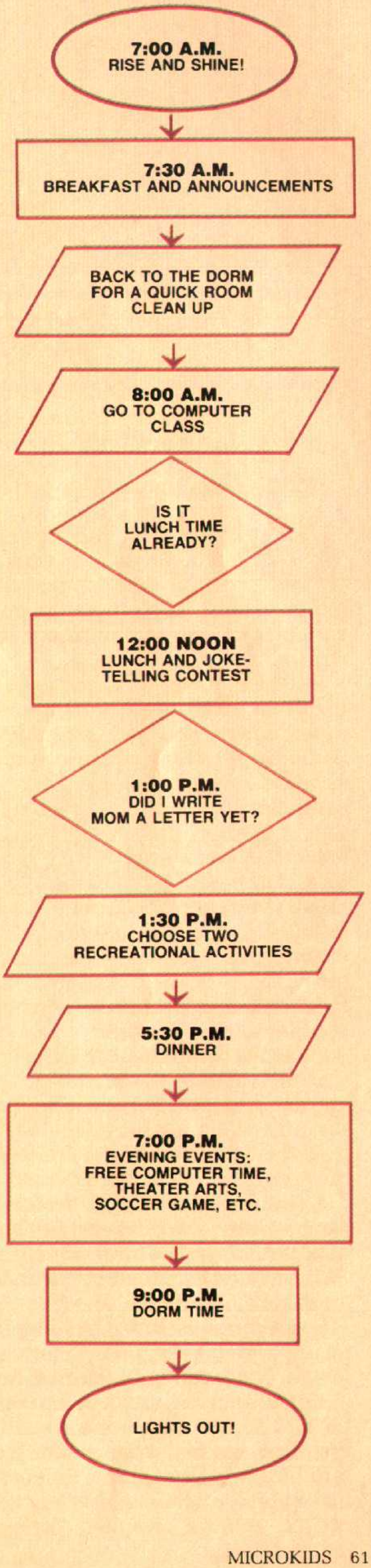




At camp: canoeing (top), one-on-one (middle), building a computer.

Photos courtesy of Champlain College Computer Camp

A TYPICAL DAY AT COMPUTER CAMP


7:00 A.M.
RISE AND SHINE!
7:30 A.M.
BREAKFAST AND ANNOUNCEMENTS
BACK TO THE DORM FOR A QUICK ROOM CLEAN UP
8:00 A.M.
GO TO COMPUTER CLASS
IS IT LUNCH TIME ALREADY?
12:00 NOON
LUNCH AND JOKE-TELLING CONTEST
1:00 P.M.
DID I WRITE MOM A LETTER YET?
1:30 P.M.
CHOOSE TWO RECREATIONAL ACTIVITIES
5:30 P.M.
DINNER
7:00 P.M.
EVENING EVENTS: FREE COMPUTER TIME, THEATER ARTS, SOCCER GAME, ETC.
9:00 P.M.
DORM TIME
LIGHTS OUT!

LANGUAGE
LAB

USING VARIABLES

BY LORETTA HOLZ

One of the most important powers of a computer is its ability to handle *variables*. These are symbols that can take on many different values. The computer uses variables to represent numbers and strings of letters.

In BASIC using LET, you can set up places in the memory of the computer where you can store data. Some people think of these places as boxes or holes. When you tell the computer LET A = 7, it chooses a unit of memory (like a box or hole), labels it A and stores the number 7 in it. The letter A represents 7 because you said so. But A could represent any number. You could, for example, say LET A = 10. Since this is so, A is called a variable. The number 7 does not change its value so it is called a constant.

After the computer stores the fact that the variable A stands for 7, if you ask it to PRINT A it will look in the unit of its memory labeled A, find the 7 there and print it out on the screen.

A is a *numeric variable*. Variables can be named using letters or a combination of letters and numbers. Some names for numeric variables are N, B1, C and L5.

Some forms of BASIC allow you to use variables of more than two letters. However, only the first two characters are important to the computer. The rest of the characters in the name can be letters or numbers but the computer ignores them. To make your program work when it is run on another computer using a different version of BASIC, it is best to stay with a single letter for a variable. Longer names can help you more easily to figure out what a specific program is doing, but they can be a problem.

All the letters can be used as variables and if you have not told the computer what a letter equals, then it will usually give you the value of zero. For example, if you say PRINT B and you have not told it anything about B then (in most forms of BASIC) you would get a zero on the screen.

You can write a simple program to show that the computer remembers numbers assigned to variables. The asterisk (*) in this program represents multiply.

```
10 LET A = 5
20 LET B = 6
30 LET C = A * B
40 PRINT C
```

Every time you run this program you should get the answer 30. Change a line: 10 LET A = 3. When you run the program, you will get 18.

The numeric variable A in the above program first stood for 5, and after you changed it, then it represented the number 3. It will continue to represent 3 until you tell the computer something else. For example: LET A = 9. Then the computer will give you 9 as the value of A until you tell it a new value. Notice that the numeric variable C changes when A or B changes. One numeric variable can depend on others and you can add, subtract and do other math calculations using them.

In addition to numeric variables, BASIC also has *string variables* which are similar to numeric variables but they cannot be used in math problems. To mark a string variable, BASIC uses the dollar sign ($), which is pronounced "string." Some names for string variables would be B$ (pronounced "bee-string"), N1$, F$ and L5$. You might say LET A$ = "tree." Strings are always placed in quotation marks when they are being assigned to a string variable.

Any group of letters, numbers or symbols is a string and strings are often words you can recognize with spaces in between them. A$ is a string variable because it could represent "purple cows give purple milk" or "little green croakers" or anything you want. You can put numbers into string variables, but these numbers cannot be used for math problems.

While you cannot mathematically add string variables together, you can join them in a process called *concatenation*. While you use the plus (+) symbol, it is not really addition but only a way of joining or attaching one to the end of the other.

```
10 LET L$ = "CON"
20 LET M$ = "CAT"
30 LET N$ = "ENA"
40 LET O$ = "TION"
50 LET P$ = L$ + M$ + N$ + O$
60 PRINT P$; " IS FUN!"
RUN
CONCATENATION IS FUN!
```

When you run this program, the four parts of the word "concatenation" print together as a word. Lines 10 through 40 define the four parts of the word as four separate string variables and line 50 concatenates them.

Note that you can make up a sentence combining strings which are not given a variable name (like "is fun" above) with strings (like P$) which are. Notice the space left within the quotation marks in line 60. If you forget to put the space inside of the quotes, then the words will run together.

While it may be interesting as an example, it is not very useful to break up a word, make the parts into string variables and by concatenation bring the whole word together again. However, if you are using the same groups of letters over and over again, it can be very practical to set them up as string variables and use them in print statements. Notice in this program there should be a space after *VA* inside of the quotation marks. This space will separate the words when they print.

```
10 LET V$ = "VA "
20 LET X$ = "VOOM"
30 LET S$ = V$ + V$ + V$ + X$
40 PRINT S$
50 LET S$ = V$ + S$
60 PRINT S$
70 LET S$ = V$ + S$
80 PRINT S$
90 PRINT X$: PRINT: PRINT
100 GOTO 30
```

Lines 10 and 20 of this program set up two string variables and line 30 concatenates the two string variables into a third one. Line 50 concatenates again changing the S$ into a new S$ which is even longer. When you run the program you can see the effect of the concatenation as it joins the letters together.

When you write a program, you can use both numeric variables and string variables, but you have to be very careful to keep them straight and use the $ in the name when you want a string variable.

```
10 LET A$ = " SILLY GIRLS "
20 LET B = 7
30 PRINT B; A$; "SANG 7 SILLY
   SONGS!"
RUN
7 SILLY GIRLS SANG 7 SILLY SONGS!
```

Line 10 sets up a place in memory to be called A$ and puts the string "SILLY GIRLS" into it. The name of the string variable is A$ and the value (or content) of A$ is " SILLY GIRLS ". Notice that there is a space inside the quotes before and after the words. This is important because if there are no spaces, the numbers and words would run together. The spaces separate the words so you can read them easily. So be very careful of spaces.

Line 20 sets up numeric variable B. In the place in memory called B, the number 7 is now stored. Line 30 asks the computer to print the contents of B, the contents of A$ and then the rest of the sentence. Experiment with this program. Change: 10 LET A$ = " SILLY BOYS " and run the program. Change: 20 LET B = 8 and again run the program. Now try to figure out how to change the program so when you run it, the screen will say: "8 SILLY BOYS AND GIRLS HUMMED 7 SILLY TUNES."

The LET command is not really setting up an equation but instead it is telling the computer that the numeric variable represents a number or constant. This ability to set up a variable, have it represent one number, and then a different number lets you use the numeric variable as a counter in your program this way.

```
10 PRINT "I CAN COUNT HIGHER"
20 PRINT "AND HIGHER"
30 PRINT A
40 LET A = A + 1
50 GOTO 20
RUN
I CAN COUNT HIGHER
AND HIGHER
1
AND HIGHER
2
AND HIGHER
3
(and so on)
```

When you run the program you can see how the numeric variable A changes. The GOTO in line 50 sends the computer back to line 20, which it prints. Then it prints the current value of A in line 30. The number is made higher in line 40 and continues to get higher each time the program cycles through the loop.

A language lab is a place where you learn to speak a language by experimenting with it. That's what this is all about. Why not take these pages with you and sit down at your computer?

In the last issue you were asked to write a program that would print your name and underneath it say that you love BASIC. These two lines should repeat down the side of the screen. Your program might look something like this:

```
10 PRINT "KIM"
20 PRINT "LOVES BASIC"
30 GOTO 10
```

Next you were to change one line and have the three words read across the line. You could make this change: 10 PRINT "KIM"; The semicolon at the end of this line is important because it tells the computer to print what comes next right beside what is on the screen. If you put a space after your name within the quotes, then the words will be separated.

You were also asked to write a program to say "THIS IS SO SILLY!" with the words under each other making the four S's come out in a vertical column. This program should do it:

```
10 PRINT " THIS"
20 PRINT "    IS"
30 PRINT "    SO"
40 PRINT "    SILLY!"
```

Notice that the spaces you put in front of the words are very important.

Using what you have learned here, now write a program which will print at least three statements saying how smart, handsome and wonderful you are. Use a string variable to represent your name.

Write a program that sets up two numeric variables, A and B. The third line should set up a third value, C, which is equal to the sum of the first two numeric variables. The last line should print out the addition problem. As a real challenge, can you make the program generate many addition problems, all different? You need to write four more lines. In two of the lines you will be adding to each of the variables (+1). Next you should repeat that C is the sum of A and B, and in the last line you have to set up the loop using GOTO. ■

Answers

Mind Benders

THE GREY FOG

THE SCREEN PROCESSED THE DISPLAY AS THE KEYBOARD CLICKED AWAY NUMBERS CAME AND NUMBERS WENT TO THE LAND OF EVIDENT

—The Grey Fog
by Captain Crypto

A FLY'S FLEETING FLIGHT

The fly traveled three-eighths of a mile.

You may be surprised to find out that it doesn't matter whose bike the fly started on, or even that the speeds of the two cyclists were different.

Liz and Abby together traveled 20 m.p.h. At that speed, it takes 45 seconds to cover one-quarter of a mile. The fly, traveling at 30 m.p.h. during those 45 seconds, covered three-eighths of a mile before the terrible collision.

THIS DAY AND AGE

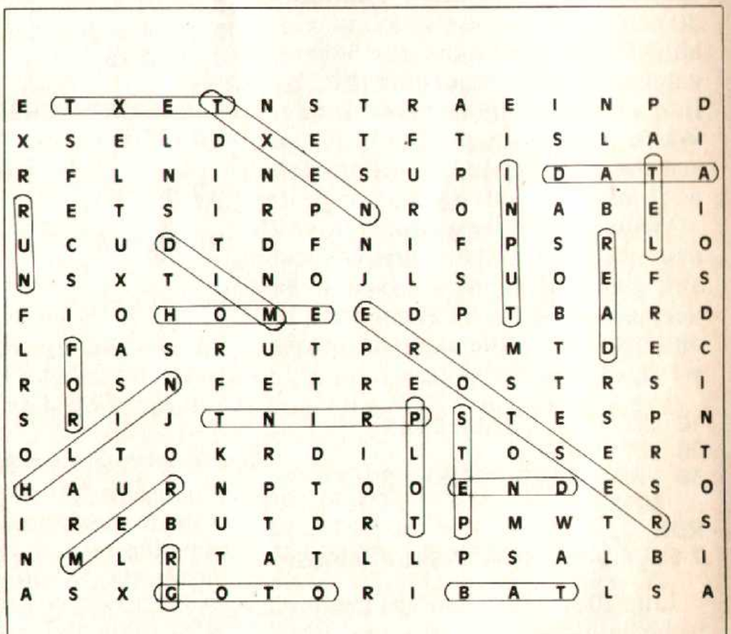
The person made the statement on January 1, and the person's birthday is December 31.

PENCIL Powered!

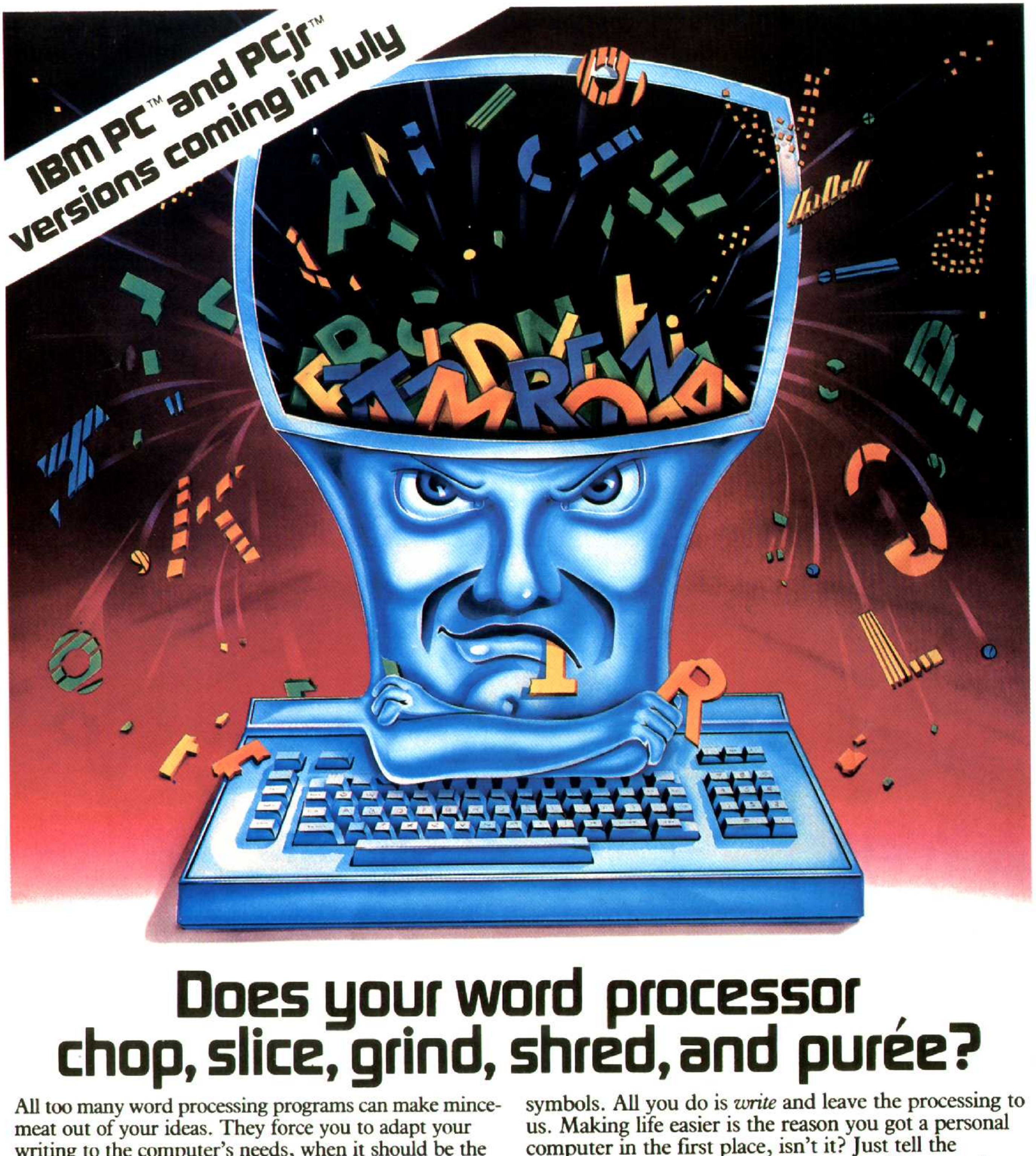
WORD TEST

1 C	2 H	3 A	4 R		5 E	6 R	7 A		8 A	9 M	10 E	11 N
12 H	A	L	T		13 R	O	W		14 T	I	D	E
15 I	L	L		16 E	A	M			17 E	C	H	O
18 P	L	A	19 N	T	S		20 S	21 T	A	R		
			22 A	C	E		23 R	E	M	O	24 T	25 E
26 H	27 A	28 C	K			29 C	A	N		30 D	U	D
31 A	M	O		32 G	33 H	O	S	T		34 O	B	I
35 R	A	M		36 A	I	M			37 S	T	E	T
38 I	N	P	39 U	T	S		40 B	41 E	E			
		42 U	N	E	S		43 A	N	A	44 L	45 O	46 G
47 B	48 E	T	A			49 S	U	D		50 O	N	E
51 I	C	E	R		52 B	E	D		53 D	A	T	A
54 T	O	R	Y		55 Y	E	S		56 O	D	O	R

MATCH GAME



E T X E T N S T R A E I N P D
X S E L D X E T F T I S L A I
R F L N I N E S U P I D A T A
R E T S I R P N R O N A B E I
U C U D T D F N I F P S R L O
N S X T I N O J L S U O E F S
F I O H O M E E D P T B A R D
L F A S R U T P R I M T D E C
R O S N F E T R E O S T R S I
S R I J T N I R P S T E S P N
O L T O K R D I L T O S E R T
H A U R N P T O O E N D E S O
I R E B U T D R T P M W T R S
N M L R T A T L L P S A L B I
A S X G O T O R I B A T L S A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